














**MDSHA BOOK OF STANDARD**  
**FOR HIGHWAYS, INCIDENTAL STRUCTURES AND TRAFFIC CONTROL APPLICATIONS**

STANDARD NUMBERS	DESCRIPTION	Dates	
		MDSHA	FHWA
	<b>CATEGORY "5" PAVING</b>		
MD 550.01	SQUARE FOOT AREAS OF PAVEMENT MARKING LETTERS, SYMBOLS, ARROWS, AND NUMBERS	05/17/07	05/02/07
MD 572.21	REINFORCED CONCRETE PAVEMENT REQUIREMENT FOR LOAD TRANSFER DEVICES	03/25/10	01/10/62
MD 572.22	REINFORCED CONCRETE PAVEMENT LOAD TRANSFER ASSEMBLY-EXPANSION JOINTS	03/25/10	07/02/85
MD 572.23	REINFORCED CONCRETE PAVEMENT LOAD TRANSFER ASSEMBLY-CONTRACTION JOINTS	03/25/10	07/02/85
MD 572.43	REINFORCED CONCRETE PAVEMENT DOWEL TUBE EXPANSION JOINT ASSEMBLY	10/01/01	07/02/85
MD 572.44	REINFORCED CONCRETE PAVEMENT DOWEL BAR KEEPER	10/01/01	07/02/85
MD 572.61	CONCRETE PAVEMENT LONGITUDINAL DEVICES TIE	08/12/02	09/04/02
MD 572.61-01	CONCRETE PAVEMENT LONGITUDINAL DEVICES TIE	03/25/10	09/04/02
MD 572.91	CONCRETE PAVEMENT LOCATION OF JOINTS	08/12/02	09/04/02
MD 572.92	CONCRETE PAVEMENT TYPES OF JOINTS	10/01/01	02/24/88
MD 572.93	COMBINATION INSERT AND SEALANT FOR CONCRETE PAVEMENT	10/01/01	11/11/75
MD 573.01	TERMINAL JOINT FOR CONTINUOUSLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT	10/01/01	11/16/92
MD 577.01	CONVENTIONALLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT REPAIRS SAW CUTS FOR LIFT OUT METHOD	10/01/01	03/18/86
MD 577.02	METHOD 'A' PLAIN PORTLAND CEMENT CONCRETE PAVEMENT TYPE 1 REPAIRS	10/01/01	04/26/89
MD 577.03	METHOD 'B' PLAIN OR CONVENTIONALLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT TYPE 1 AND TYPE 2 REPAIRS	10/01/01	04/26/89

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STANDARD NUMBERS	DESCRIPTION	Dates	
		MDSHA	FHWA
	<b>CATEGORY "5" PAVING</b>		
MD 577.04	METHOD 'C' PLAIN OR CONVENTIONALLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT TYPE 1 AND TYPE 2 REPAIRS	10/01/01	04/26/89
MD 577.05	METHOD 'D' PLAIN OR CONVENTIONALLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT TYPE 1 AND TYPE 2 REPAIRS	10/01/01	04/26/89
MD 577.06	METHOD 'E' PLAIN OR CONVENTIONALLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT TYPE 1 AND TYPE 2 REPAIRS	10/01/01	04/26/89
MD 577.07	JOINTS FOR PLAIN OR CONVENTIONALLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENTS	10/01/01	02/24/88
MD 577.08	DOWEL AND TIE BAR ANCHORAGE FOR TYPE 1 AND TYPE 2 PAVEMENT REPAIRS	10/01/01	06/08/90
MD 577.10	CONTINUOUSLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT REPAIRS	10/01/01	06/08/90
MD 578.01	REPAIRING PAVEMENT OPENINGS FOR UTILITY TRENCHES	03/25/10	03/18/86
MD 578.03	PERMANENT PATCHING FOR RIGID OR FLEXIBLE PAVEMENT USING HOT MIX ASPHALT	10/01/01	03/18/86
MD 579.01	TYPICAL HOLE PATTERNS FOR PORTLAND CEMENT CONCRETE PAVEMENT SUBSEALING	10/01/01	02/02/88

### SQUARE FOOT AREAS OF SYMBOLS AND ARROWS

SYMBOL	DESCRIPTION	AREA (SQ. FT.)
	THROUGH LANE-USE	12.5
	TURN LANE-USE (LEFT OR RIGHT)	15.5
	TURN AND THROUGH LANE- USE (LEFT OR RIGHT)	25.5
	LANE-REDUCTION (LEFT OR RIGHT)	42.0
	FREEWAY, EXPRESSWAY AND RAMP ARROW	24.4
	WRONG WAY ARROW	23.8
	HOV LANE	13.5
	ACCESSIBILITY (BLUE BACKGROUND)	10.0
	BIKE LANE	7.5
	BIKE LANE ARROW	5.5
	RAILROAD-CROSSING	64.7 (TOTAL)
	"R" (6' HIGH)	3.6 (EACH)
	"X" (20' HIGH)	57.5
	YIELD AHEAD TRIANGLE	
	POSTED SPEED LIMIT 45 MPH OR GREATER	43.0
	POSTED SPEED LIMIT LESS THAN 45 MPH	34.0
	SHARKS TEETH	6.0

NOTE: REFER TO THE MOST RECENT VERSION OF THE MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND THE FHWA STANDARD HIGHWAY SIGNS MANUAL FOR DIMENSIONS OF ALL PAVEMENT MARKING LETTERS, SYMBOLS, ARROWS, AND NUMBERS.

### SQUARE FOOT AREAS OF LEGENDS

LEGEND	SIZE/DESCRIPTION	AREA (SQ. FT.)
AHEAD	8' HIGH	29.0
LANE	8' HIGH (STANDARD)	22.3
LEFT	8' HIGH	18.2
ONLY	8' HIGH	20.8
PED	8' HIGH	17.3
RIGHT	8' HIGH	24.5
SCHOOL	8' HIGH (STANDARD)	32.3
	10' HIGH (ACROSS TWO LANES)	94.0
SLOW	8' HIGH	22.8
STOP	8' HIGH	20.8
TURN	8' HIGH	22.8
XING	8' HIGH	20.3
YIELD	8' HIGH	22.3

### SQUARE FOOT AREAS OF NUMBERS

NUMBER	1	2	3	4	5	6	7	8	9	0
SIZE										
SMALL (6 FT.)	1.5	3.3	3.3	2.9	3.5	3.5	2.2	3.8	3.5	3.4
LARGE (8 FT.)	2.6	5.8	5.8	5.1	6.1	6.2	3.8	6.7	6.2	6.0

### SQUARE FOOT AREAS OF LETTERS

LETTER	A	B	C	D	E	F	G	H	I	J	K
SIZE											
SMALL (6 FT.)	3.1	4.0	2.7	3.4	3.3	2.6	3.3	3.4	1.5	2.1	3.1
LARGE (8 FT.)	5.5	7.1	4.8	6.1	5.9	4.7	5.8	6.0	2.6	3.7	5.7

L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
2.2	4.2	4.0	3.4	3.0	3.6	3.6	3.2	2.2	3.2	2.7	4.2	2.7	2.2	2.9
3.8	7.4	7.1	6.0	5.3	6.3	6.3	5.7	3.8	5.6	4.8	7.3	4.8	3.9	5.1

SPECIFICATION CATEGORY CODE ITEMS

APPROVED

DIRECTOR - OFFICE OF TRAFFIC AND SAFETY



APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 5-17-07	APPROVAL 5-2-07
REVISED	REVISED
REVISED	REVISED
REVISED	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**SQUARE FOOT AREAS OF PAVEMENT MARKING**  
**LETTERS, SYMBOLS, ARROWS, AND NUMBERS**

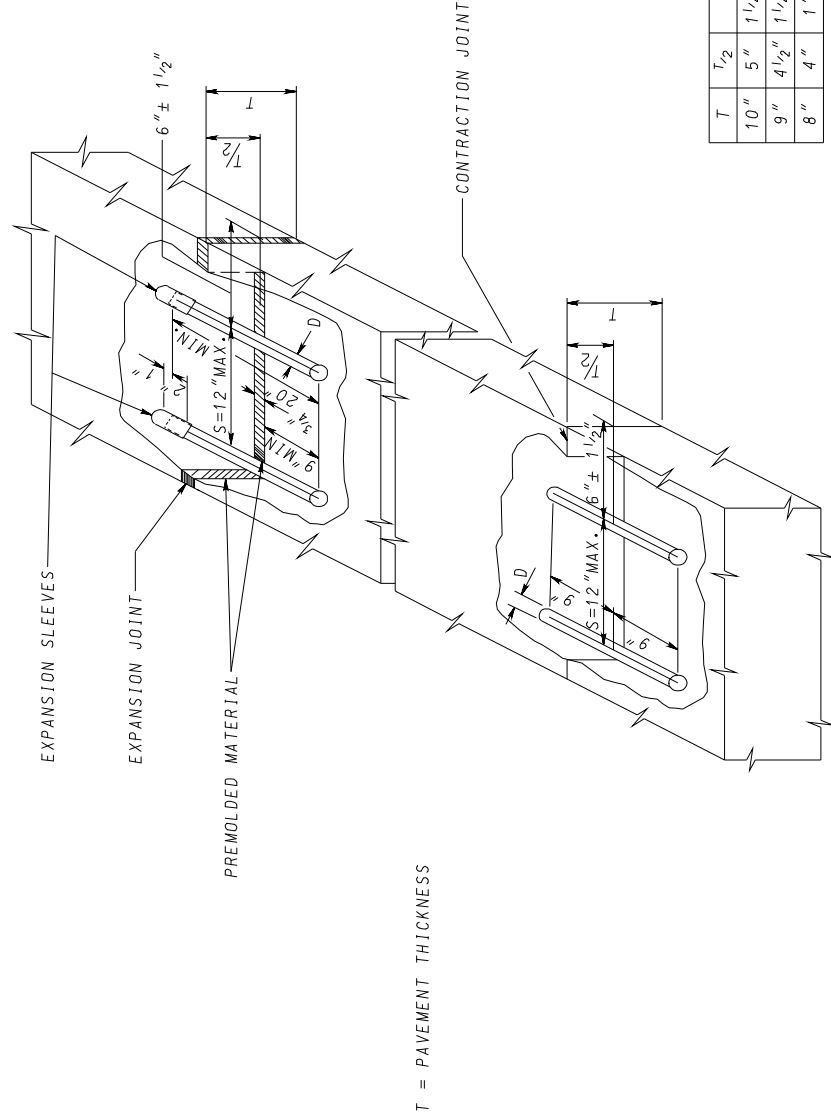
STANDARD NO.

MD 550.01

## NOTES

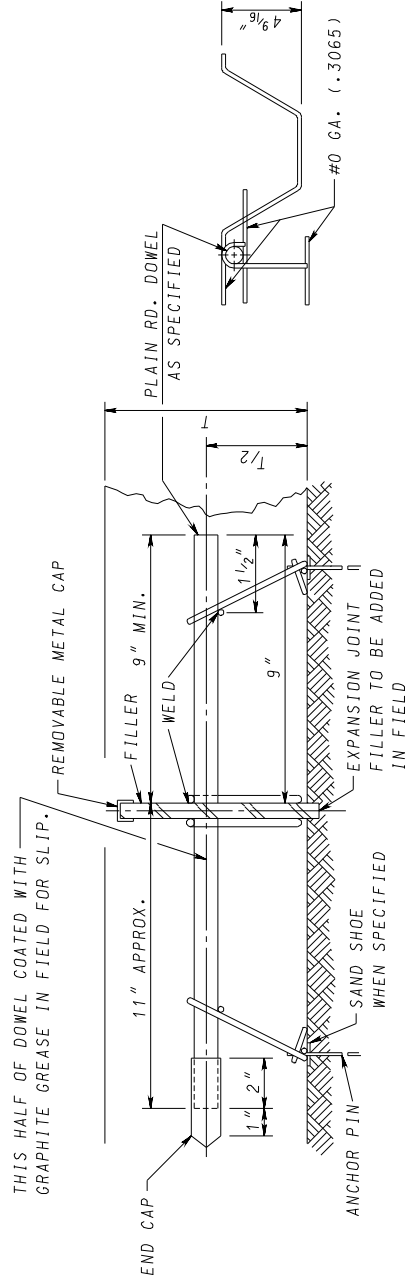
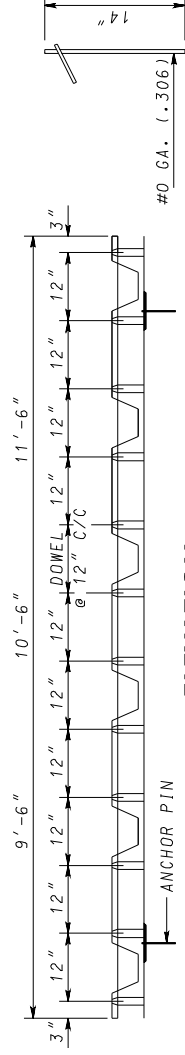
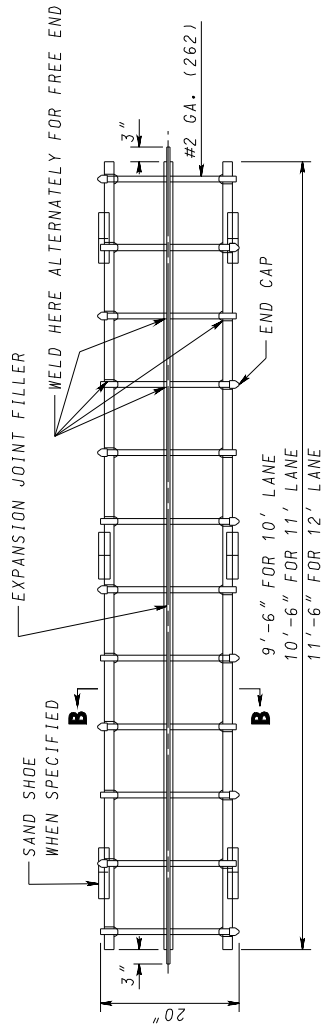
1. DOWELS SHALL BE ASSEMBLED IN A RIGID FRAMEWORK OF A LENGTH EQUAL TO A LANE WIDTH. THE EXPANSION JOINT FRAMEWORK SHALL PROVIDE ADEQUATE SUPPORT TO MAINTAIN THE PREMOLDED JOINT FILLER IN THE PROPER HORIZONTAL AND VERTICAL ALIGNMENT.
2. THE FRAMEWORK SHALL BE STRONG ENOUGH TO SUPPORT A 200 POUND CONCENTRATED LOAD WITHOUT DEFORMATION OR FAILURE.
3. ANCHOR PINS SHALL BE USED TO SECURE THE FRAMEWORK AGAINST ANY MOVEMENT ALONG THE SUBGRADE.
4. THE DOWELS AND SUPPORTING FRAMEWORK SHALL BE STABLE AGAINST OVERTURNING, INDEPENDENT OF ANY ANCHOR PINS, AND UPON APPLICATION OF THE 200 POUND CONCENTRATED LOAD THEY SHALL NOT BE DEPRESSED BELOW THEIR NORMAL POSITION IN THE PAVEMENT SLAB.
5. THE FREE MOVING OR UNANCHORED END OF ALL DOWEL BARS IN BOTH CONTRACTION AND EXPANSION JOINTS SHALL BE COATED AFTER INSTALLATION OF THE DEVICE UPON THE SUBGRADE AND IMMEDIATELY PRIOR TO THE POURING OF THE CONCRETE WITH GRAPHITE GREASE APPLIED WITH A GLOVED HAND. THIS SAME END OF ALL EXPANSION JOINT DOWEL BARS SHALL BE CAPPED WITH A SNUG FITTING CLOSED END METAL EXPANSION SLEEVE TEMPORARILY SECURED TO THE BAR SO AS TO PROVIDE A 1" LONG OPEN SOCKET BEYOND THE BAR END AND TO LAP BACK 2" ON THE BAR AT THE TIME OF INSTALLATION.
6. THE DOWEL (D) SIZES SHOWN BELOW WILL BE USED FOR THE PAVEMENT THICKNESS INDICATED UNLESS OTHERWISE STATED IN THE SPECIAL PROVISIONS.
7. SEE SECTION 908.02 FOR DOWEL/BAR MATERIAL SPECIFICATIONS.

EXPANSION JOINT ONLY:  
DOWEL BAR TO BE MINIMUM LENGTH OF 20". IF BAR IS NOT CENTERED, THE LONG SIDE SHALL BE THE FREE END.

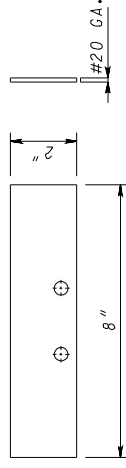


T	$T_{1/2}$	D
10"	5"	1 1/4" $\Phi$
9"	4 1/2"	1 1/4" $\Phi$
8"	4"	1" $\Phi$

Maryland Department of Transportation STATE HIGHWAY ADMINISTRATION STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  REINFORCED CONCRETE PAVEMENT REQUIREMENT FOR LOAD TRANSFER DEVICES  STANDARD NO. MD 572.21	
SPECIFICATION	CATEGORY CODE ITEMS
APPROVED	<div><div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div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NOTE: ALL DOWEL BARS SHALL BE EPOXY COATED.




## SAND SHOE

THE DIAMETER (D) OF ALL BARS SHALL BE AS SHOWN ON STD. MD 572-2.1. SAND SHOE ADDED WHEN SPECIFIED ARE TO BE USED UNDER THE FRAME TO HOLD DOWEL UNIT IN TRUE ALIGNMENT. THE UNITS ARE TO BE STAKED IN PLACE BY DRIVING #0 GA. PINS IN NUMBERS AND TO A DEPTH AS SUBGRADE CONDITIONS MAKE NECESSARY ALONG BOTH SIDES OF THE FRAME. A MINIMUM OF SIX (6) STAKES SHALL BE USED FOR EACH ASSEMBLY. THE UNITS ARE TO BE SHOP FABRICATED AS TO FRAME, ETC. THE SAND SHOES (WHEN SPECIFIED), JOINT FILLER, JOINT CAP, & EXPANSION TUBES ARE TO BE ADDED IN THE FIELD. ALTERNATIVE LOAD TRANSFER ASSEMBLIES MAY BE SUBMITTED TO OMT'S PAVEMENT & GEOTECHNICAL DIVISION FOR CONSIDERATION OF APPROVAL.

Maryland Department of Transportation STATE HIGHWAY ADMINISTRATION STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES REINFORCED CONCRETE PAVEMENT LOAD TRANSFER ASSEMBLY - EXPANSION JOINTS  STANDARD NO. MD 572.22		
SPECIFICATION	CATEGORY CODE ITEMS	
APPROVED	<div>Kirk G. McCall</div> <div>DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT</div>	
	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 7-14-61	APPROVAL 7-7-67
	REVISION 10-1-01	REVISION 7-2-85
	REVISION 3-25-10	REVISION
	REVISION	REVISION



## STAKE

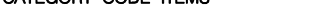

SPECIFICATION	CATEGORY CODE ITEMS	
APPROVED	<i>Kate G. McCall</i>	
	DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 7-14-61	APPROVAL 7-7-67
	REVISED 10-1-01	REVISED 7-2-85
	REVISED 3-25-10	REVISED
	REVISED	REVISED

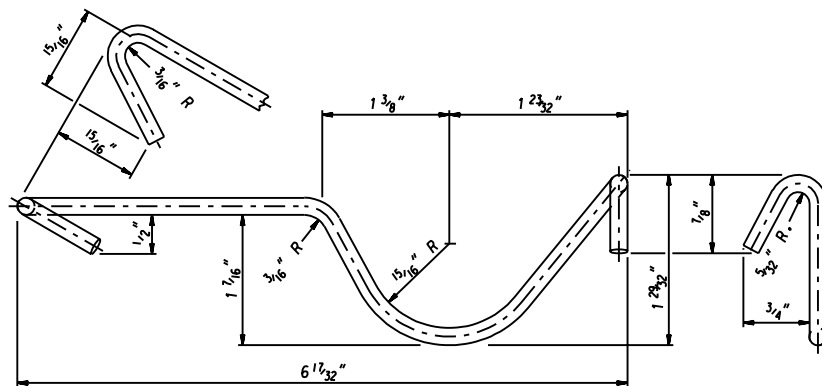
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**REINFORCED CONCRETE PAVEMENT**  
**LOAD TRANSFER ASSEMBLY -**  
**CONTRACTION JOINTS**

STANDARD NO.

MD 572.23



SPECIFICATION		CATEGORY CODE ITEMS		<b>Maryland Department of Transportation</b> <b>STATE HIGHWAY ADMINISTRATION</b> STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  <b>REINFORCED CONCRETE PAVEMENT</b> <b>DOWEL TUBE EXPANSION JOINT ASSEMBLY</b>  <b>STANDARD NO. MD 572.43</b>	
APPROVED		 DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT			
		APPROVAL • SHA REVISIONS APPROVAL <b>4-1-61</b> REVISED <b>10-1-01</b> REVISED REVISED			



MATERIAL #6 GA. SPRING WIRE  
 APPROX. STOCK LENGTH =  $10\frac{1}{4}$ "  
 APPROX. WEIGHT PER PIECE = .084 LBS.

SPECIFICATION	CATEGORY CODE ITEMS
---------------	---------------------

APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
----------	---

<b>SHA</b> State Highway Administration	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 8-1-62	APPROVAL 1-17-63
	REVISED 10-1-01	REVISED 7-2-85
	REVISED	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

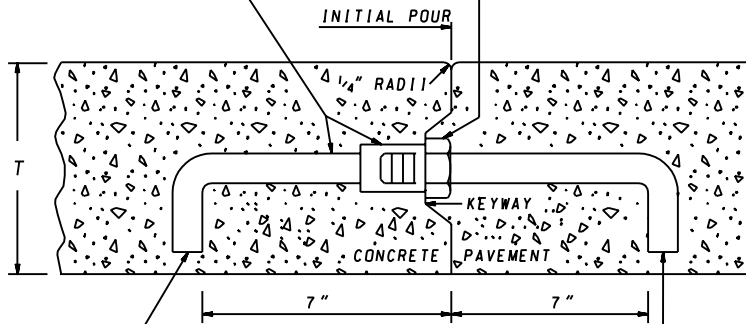
**REINFORCED CONCRETE PAVEMENT  
 DOWEL BAR KEEPER**

**STANDARD NO. MD 572.44**



SOLID BAR & SLEEVE MAY  
BE REPLACED BY TUBE  
WITH INTERNAL THREAD.

TAP-BOLT FOR INITIAL INSTALLATION

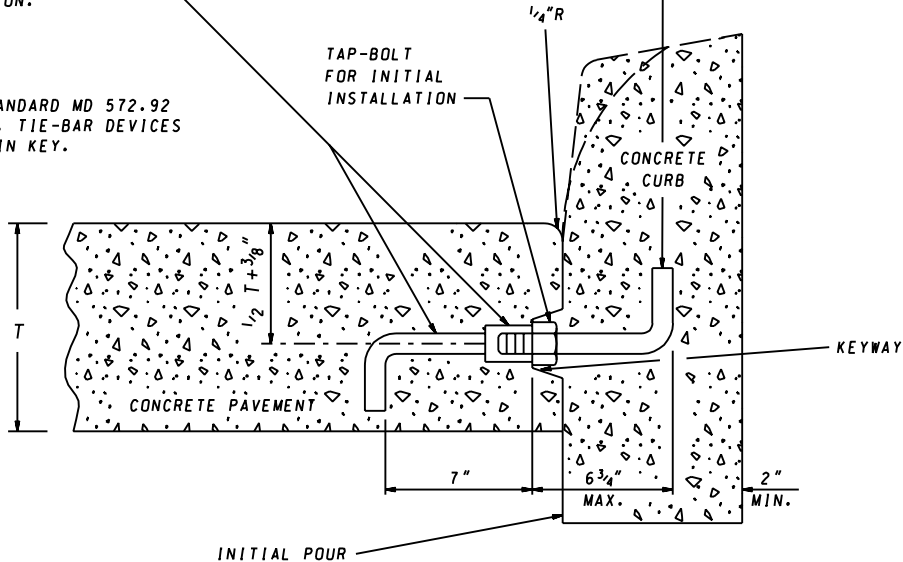


### LONGITUDINAL TIE DEVICE "J" BAR

NOTE:  
HOOK END OF BAR  
SHALL BE PLACED  
ALONG A DIAGONAL  
OF THE SQUARE  
CROSS SECTION.

NOTE:  
HOOK END OF BAR SHALL BE  
PLACED ALONG A DIAGONAL  
OF THE SQUARE CROSS SECTION.

SEE PLANS OR STANDARD MD 572.92  
FOR KEY SECTION. TIE-BAR DEVICES  
TO BE CENTERED IN KEY.



### LONGITUDINAL TIE DEVICE - "J" BAR MODIFIED

T = PAVEMENT THICKNESS

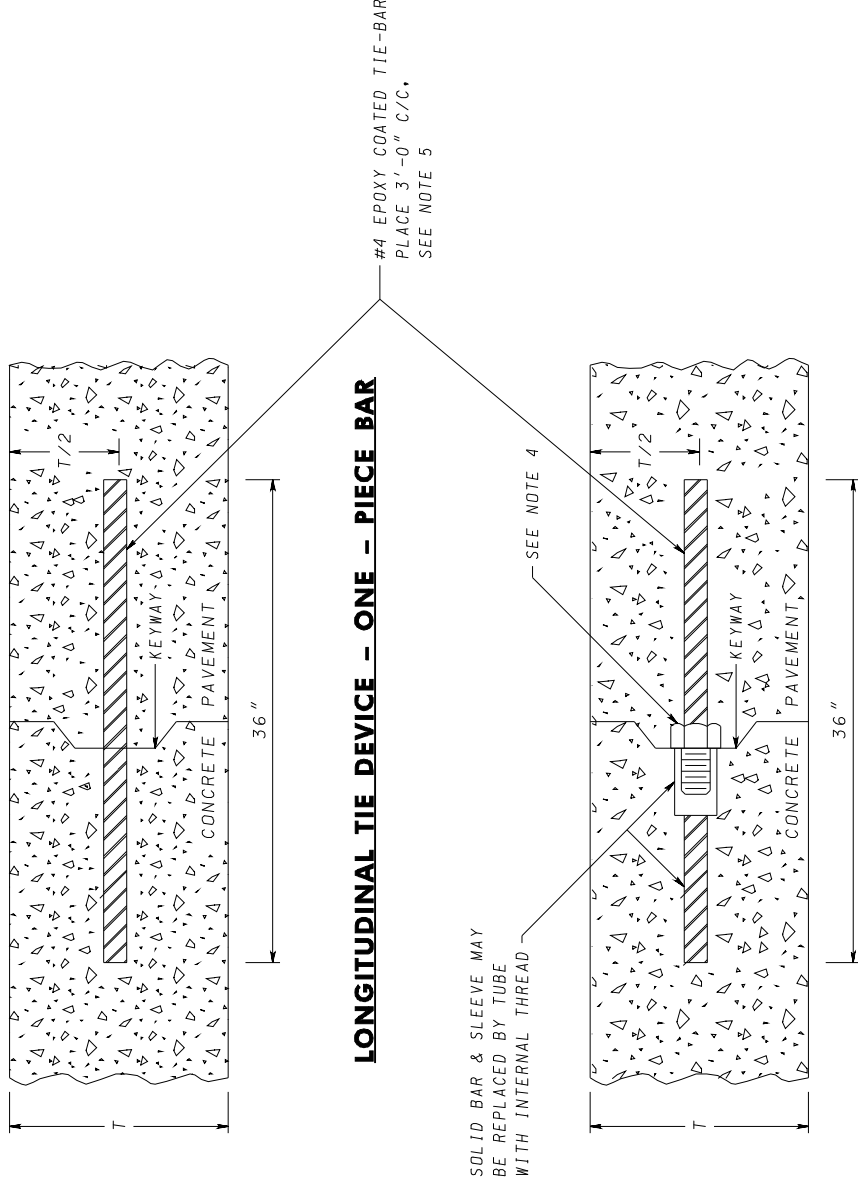
FOR APPLICABLE NOTES REFER TO STANDARD 572.61-01

SPECIFICATION	CATEGORY CODE ITEMS										
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT										
<b>SHA</b> State Highway Administration	<table> <tr> <th>APPROVAL • SHA REVISIONS</th><th>APPROVAL • FEDERAL HIGHWAY ADMINISTRATION</th></tr> <tr> <td>APPROVAL 6-15-64</td><td>APPROVAL 7-21-65</td></tr> <tr> <td>REVISED 8-12-02</td><td>REVISED 9-4-02</td></tr> <tr> <td>REVISED</td><td>REVISED</td></tr> <tr> <td>REVISED</td><td>REVISED</td></tr> </table>	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	APPROVAL 6-15-64	APPROVAL 7-21-65	REVISED 8-12-02	REVISED 9-4-02	REVISED	REVISED	REVISED	REVISED
APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION										
APPROVAL 6-15-64	APPROVAL 7-21-65										
REVISED 8-12-02	REVISED 9-4-02										
REVISED	REVISED										
REVISED	REVISED										

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

### CONCRETE PAVEMENT LONGITUDINAL TIE DEVICES

**STANDARD NO. MD 572.61**



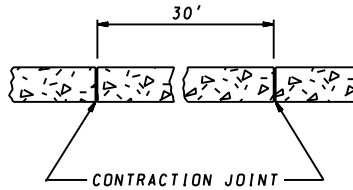
## LONGITUDINAL TIE DEVICE - TWO - COMPONENT BAR

T = PAVEMENT THICKNESS

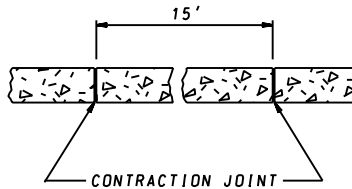
### NOTES

1. SEE SECTION 908.09 FOR TIE- BAR MATERIAL SPECIFICATIONS.
2. ANY SIMILAR DEVICE MAY BE SUBMITTED FOR CONSIDERATION BY THE ENGINEER AND OMT'S PAVEMENT & GEOTECHNICAL DIVISION. IF THE GENERAL TYPE OF A SUBSTITUTION IS APPROVED, THE DEVICE MUST STILL MEET THE STRENGTH REQUIREMENTS APPEARING IN THE SPECIFICATIONS OR SPECIAL PROVISIONS.
3. THE PORTION OF THE DEVICE INITIALLY INSTALLED MUST BE HELD FIRMLY IN PLACE BY TAP - BOLTS INSERTED THROUGH DRILLED HOLES. IF HOLES IN THE FORMS HAVE BEEN FORMED BY ANY OTHER METHOD THAN DRILLING THEN STEEL WASHERS MUST BE USED IN ADDITION TO THE TAP - BOLTS AS DIRECTED BY THE ENGINEER.
4. TAP- BOLTS REQUIRED FOR INITIAL INSTALLATION IF FORMS ARE USED FOR PLACEMENT OF CONCRETE. OTHERWISE THE FEMALE END OF A TWO- COMPONENT TIE- BAR SHALL BE PLACED ON CHAIRS OR PLACED INTO CONCRETE WHEN SUFFICIENT STRENGTH HAS BEEN REACHED TO SUPPORT THE BAR IN THE SPECIFIED POSITION IN THE SLAB. ANOTHER METHOD IS TO DRILL HOLES INTO THE LONGITUDINAL JOINT FACE AND INSERT THE TIE- BAR INTO THE HOLE AND SECURE WITH BONDING MATERIAL SPECIFIED IN 902.11.
5. ONE- PIECE TIE- BARS SHALL BE STRAIGHT OR NINETY- DEGREE BENT TIE- BARS. BENT TIE- BARS ARE INSERTED INTO LONGITUDINAL JOINT FACE DURING PAVING AND STRAIGHTENED PRIOR TO ADJACENT SLAB. ONE- PIECE TIE- BAR PLACEMENT IN LONGITUDINAL JOINT IS THE SAME AS THE FEMALE END PLACEMENT OF THE TWO- COMPONENT BAR (SEE NOTE 4).

SPECIFICATION	CATEGORY CODE ITEMS	
APPROVED	<div> <div> </div> <div> <i>Kat G. McCall</i>  DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT </div> </div>	
	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 6-15-64 REVISION 8-12-02	APPROVAL 7-21-65 REVISION 9-4-02
	REVISION 3-25-10 REVISION	REVISION REVISION
<b>Maryland Department of Transportation</b> <b>STATE HIGHWAY ADMINISTRATION</b> STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  <b>CONCRETE PAVEMENT</b> <b>LONGITUDINAL TIE DEVICES</b>		
STANDARD NO.		MD 572.61-01




**TRANSVERSE JOINT SPACING FOR REINFORCED CONCRETE PAVEMENT**

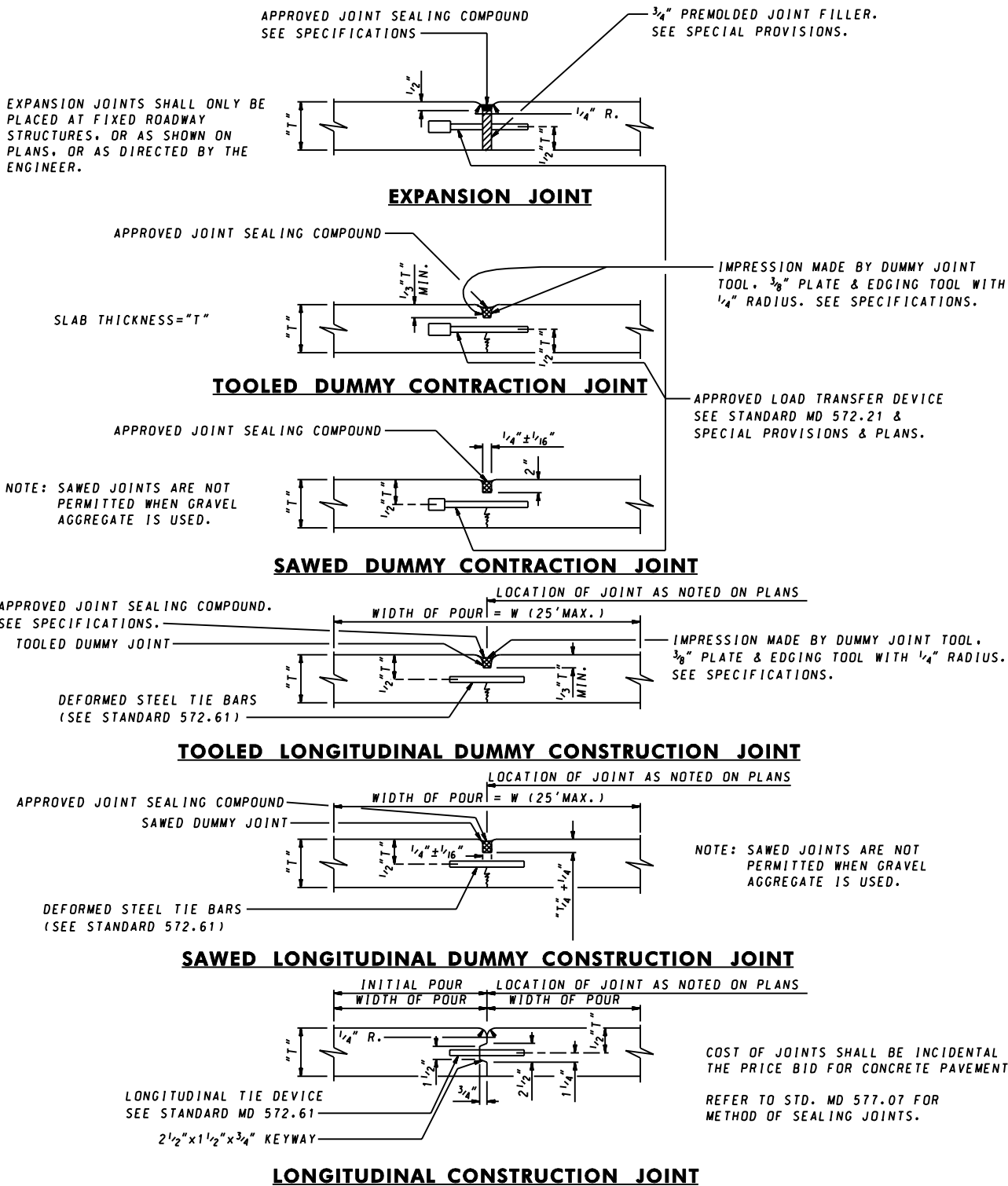


**TRANSVERSE JOINT SPACING FOR UNREINFORCED CONCRETE PAVEMENT**

**NOTE**

NEW JOINT SPACING SHALL MATCH ANY EXISTING JOINT SPACING REMAINING IN PLACE.

SPECIFICATION	CATEGORY CODE ITEMS	<b>Maryland Department of Transportation</b> <b>STATE HIGHWAY ADMINISTRATION</b> STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  <b>CONCRETE PAVEMENT LOCATION OF JOINTS</b>	
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT		
	APPROVAL • SHA	APPROVAL • FEDERAL	<b>STANDARD NO. MD 572.91</b>
	REVISIONS	HIGHWAY ADMINISTRATION	
	APPROVAL 3-17-69	APPROVAL 3-19-69	
	REVISED 8-12-02	REVISED 9-4-02	
	REVISED	REVISED	
	REVISED	REVISED	



SPECIFICATION <b>523</b>	CATEGORY CODE ITEMS										
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT										
<b>SHA</b> State Highway Administration	<table> <tr> <td>APPROVAL • SHA REVISIONS</td><td>APPROVAL • FEDERAL HIGHWAY ADMINISTRATION</td></tr> <tr> <td>APPROVAL 3-17-69</td><td>APPROVAL 3-19-69</td></tr> <tr> <td>REVISED 10-1-01</td><td>REVISED 2-24-88</td></tr> <tr> <td>REVISED</td><td>REVISED</td></tr> <tr> <td>REVISED</td><td>REVISED</td></tr> </table>	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	APPROVAL 3-17-69	APPROVAL 3-19-69	REVISED 10-1-01	REVISED 2-24-88	REVISED	REVISED	REVISED	REVISED
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APPROVAL 3-17-69	APPROVAL 3-19-69										
REVISED 10-1-01	REVISED 2-24-88										
REVISED	REVISED										
REVISED	REVISED										

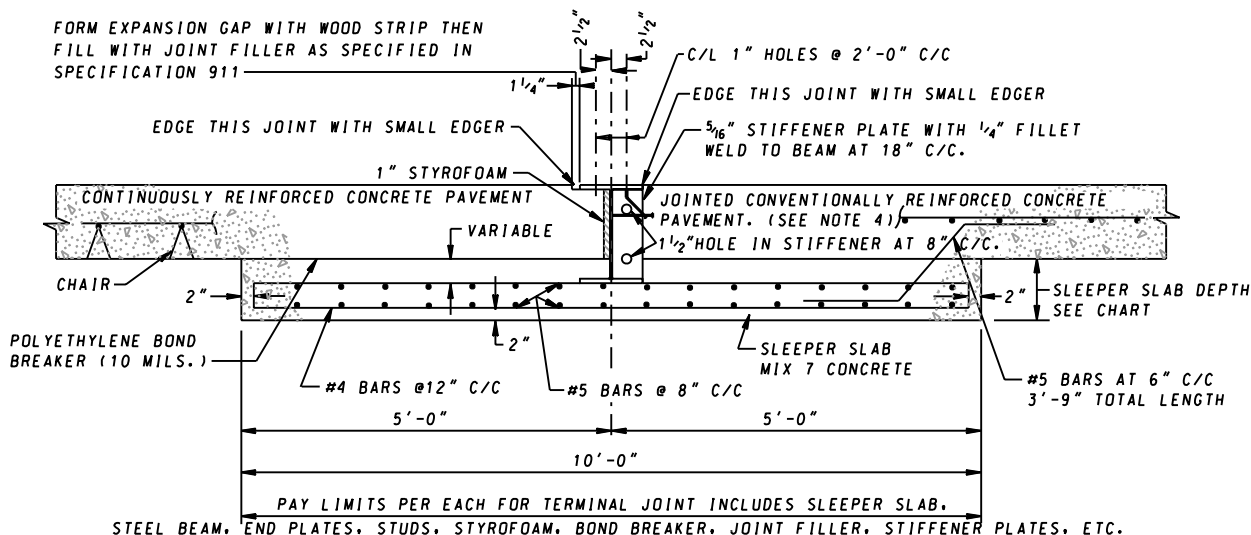
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

### CONCRETE PAVEMENT TYPES OF JOINTS

**STANDARD NO. MD 572.92**



FORM EXPANSION GAP WITH WOOD STRIP THEN FILL WITH JOINT FILLER AS SPECIFIED IN SPECIFICATION 911



### TERMINAL JOINT

STUDS TO BE PLACED INTO JOINTED CONVENTIONALLY REINFORCED CONCRETE PAVEMENT.

3/4" Ø X 8" STUDS AT 18" C/C (STAGGERED WITH STIFFENER PLATES)

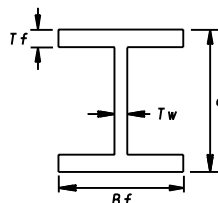
BOND BREAKER ON UNDERSIDE OF FLANGE REFER TO SPECIFICATIONS 911 OR 921

END PLATE (SEE NOTE 5)

HEAVILY GREASED SURFACE

DRILL 1" END PLATE DRAIN HOLE

STUDS (SEE WF BEAM DETAIL)



### WF BEAM DETAIL

### TERMINAL JOINT BLOW UP

CONT. REIN. CEM. CONC. PVT. (DEPTH IN.)	SLEEPER SLAB (DEPTH IN.)	WF (BEAM SIZES)	WF BEAM DIMENSIONS			
			d	Bf	Tf	Tw
9	12	W14 X 68	14.04	10.035	0.720	0.415
10	12	W16 X 57	16.43	7.120	0.714	0.430
11	12	W16 X 57	16.43	7.120	0.714	0.430
12	14	W16 X 100	16.97	10.425	0.985	0.585

### NOTES

1. AREAS OF THE METAL FLANGE THAT WILL BE IN CONTACT WITH ANY JOINT SEALANT SHALL BE CLEAN, DRY AND COMPLETELY FREE OF ALL FOREIGN MATERIAL BEFORE SEALING. USING METHODS APPROVED BY THE ENGINEER.
2. JOINTS SHALL BE CLEAN, DRY, AND COMPLETELY FREE OF ALL FOREIGN MATERIAL BEFORE SEALING. USING METHODS APPROVED BY THE ENGINEER. THE AMBIENT AND PAVEMENT TEMPERATURES SHALL BE AT LEAST 45°F AND RISING BEFORE THE SEALER CAN BE APPLIED.
3. WHEN THE SHOULDERS ARE JOINTED CONVENTIONAL OR CONTINUOUSLY REINFORCED CONCRETE PAVEMENT THE TERMINAL JOINT AND THE SLEEPER SLAB SHALL EXTEND THROUGH THE SHOULDER WIDTH.
4. AT THE LIMIT OF WORK THIS MAY BE CONTINUOUSLY REINFORCED CONCRETE PAVEMENT AS THE START OF THE ADJACENT CONTRACT.
5. A 1/4" STEEL END PLATE OF THE SAME OUTSIDE DIMENSIONS AS THE END OF THE WIDE FLANGE BEAM SHALL BE TACK WELDED TO THE ENDS OF THE WF BEAM AFTER THE REMOVAL OF THE FORMS.
6. THE CROSS SLOPE OF THE WF BEAM SHALL BE THE SAME AS THE PROPOSED PAVEMENT AND SHOULDERS. REFER TO THE ROADWAY TYPICAL SECTIONS.

SPECIFICATION  
**521**

CATEGORY CODE ITEMS

APPROVED

*Kirk G. McCall*  
DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT

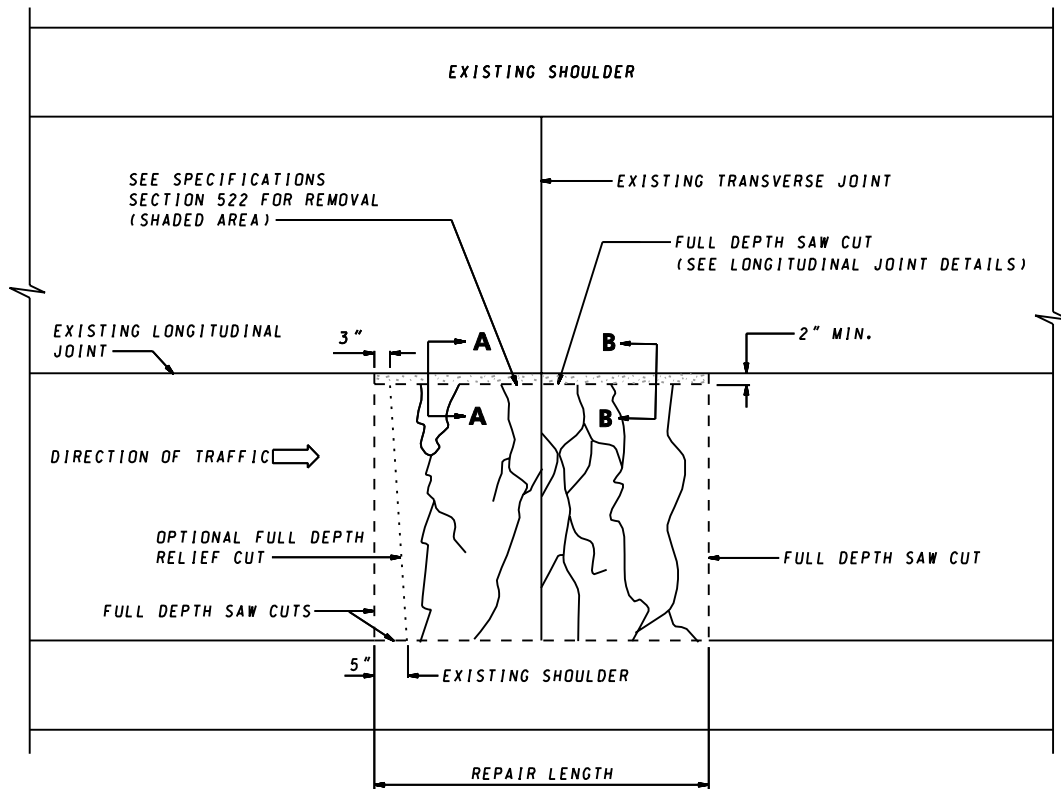


APPROVAL • SHA REVISIONS  
APPROVAL **3-23-95**  
REVISED **10-1-01**  
REVISED  
REVISED

APPROVAL • FEDERAL HIGHWAY ADMINISTRATION  
APPROVAL **11-16-92**  
REVISED  
REVISED  
REVISED

## Maryland Department of Transportation STATE HIGHWAY ADMINISTRATION STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES TERMINAL JOINT FOR CONTINUOUSLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT

**STANDARD NO. MD 573.01**

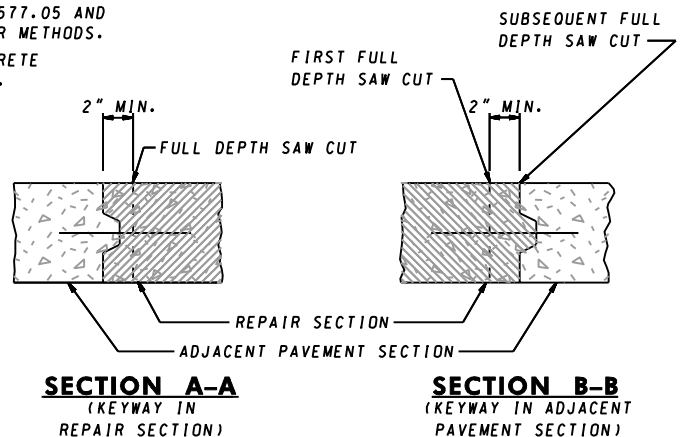


**PLAN**

**NOTES**

1. SHOULDER JOINT CUTS MAY BE CUT DIRECTLY ON THE EXISTING JOINT.
2. CUTS RUNNING PARALLEL AND ADJACENT TO A LANE OF TRAFFIC SHALL BE MADE A MINIMUM OF 2 IN. IN FROM THE EXISTING JOINT.
3. SAW CUTS MAY BE MADE INTO THE SHOULDER.
4. DASHED LINES INDICATE CUTS TO BE MADE.
5. SEE STANDARDS MD 577.02, MD 577.03, MD 577.04, MD 577.05 AND MD 577.06 FOR DETAILS OF TYPE 1 AND TYPE 2 REPAIR METHODS.
6. ALL SAW CUTS ARE INCIDENTAL TO THE SPECIFIC CONCRETE PAVEMENT REPAIRS ITEM IN THE INVITATION FOR BIDS.

NOTE: IF IT IS DETERMINED THAT THE KEYWAY IS FORMED IN THE ADJACENT PAVEMENT SECTION, THE SUBSEQUENT FULL DEPTH SAW CUT MAY BE MADE ON THE LONGITUDINAL JOINT.



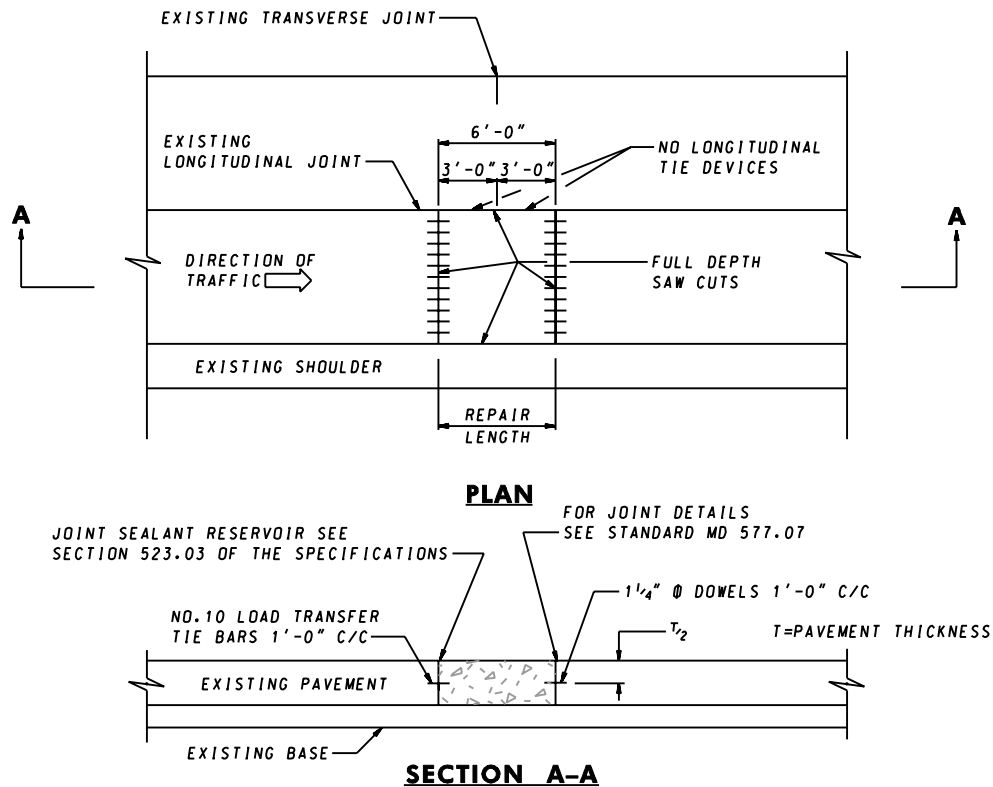
**LONGITUDINAL JOINT DETAILS**

SPECIFICATION <b>522</b>	CATEGORY CODE ITEMS										
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT										
<b>SHA</b> State Highway Administration	<table> <tr> <td>APPROVAL • SHA REVISIONS</td><td>APPROVAL • FEDERAL HIGHWAY ADMINISTRATION</td></tr> <tr> <td>APPROVAL <b>3-6-86</b></td><td>APPROVAL <b>3-18-86</b></td></tr> <tr> <td>REVISED <b>10-1-01</b></td><td>REVISED</td></tr> <tr> <td>REVISED</td><td>REVISED</td></tr> <tr> <td>REVISED</td><td>REVISED</td></tr> </table>	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	APPROVAL <b>3-6-86</b>	APPROVAL <b>3-18-86</b>	REVISED <b>10-1-01</b>	REVISED	REVISED	REVISED	REVISED	REVISED
APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION										
APPROVAL <b>3-6-86</b>	APPROVAL <b>3-18-86</b>										
REVISED <b>10-1-01</b>	REVISED										
REVISED	REVISED										
REVISED	REVISED										

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**CONVENTIONALLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT REPAIRS**  
**SAW CUTS FOR LIFT OUT METHOD**

**STANDARD NO. MD 577.01**

**METHOD 'A'** REPAIRS PERFORMED AT AN EXISTING TRANSVERSE JOINT EVEN THOUGH ONLY ONE SIDE NEEDS REPAIR. THE TOTAL REPAIR LENGTH SHALL BE 6' CENTERED ON THE ADJACENT TRANSVERSE JOINT.



### REPAIR GUIDELINES

1. TYPE 1 REPAIRS ARE 6 FT TO LESS THAN 15 FT IN LENGTH AND REQUIRE NO REINFORCEMENT. (PLAIN CONCRETE)
2. REPAIR SLABS AND REMAINS OF EXISTING SLABS SHALL NOT BE LESS THAN 6 FT IN LENGTH.
3. EXISTING DOWELS AND ASSEMBLIES SHALL BE COMPLETELY REMOVED WHEN A REPAIR IS PERFORMED AT A TRANSVERSE JOINT.
4. ALL REPAIRS OFFSET MORE THAN 3 FT ON EITHER SIDE OF AN EXISTING TRANSVERSE JOINT SHALL BE EXTENDED TO A MINIMUM OF 6 FT AND DOWEL ASSEMBLIES SHALL BE PLACED ADJACENT TO THE EXISTING TRANSVERSE JOINTS AS SHOWN IN REPAIR METHOD 'C' ON STANDARD MD 577.04.

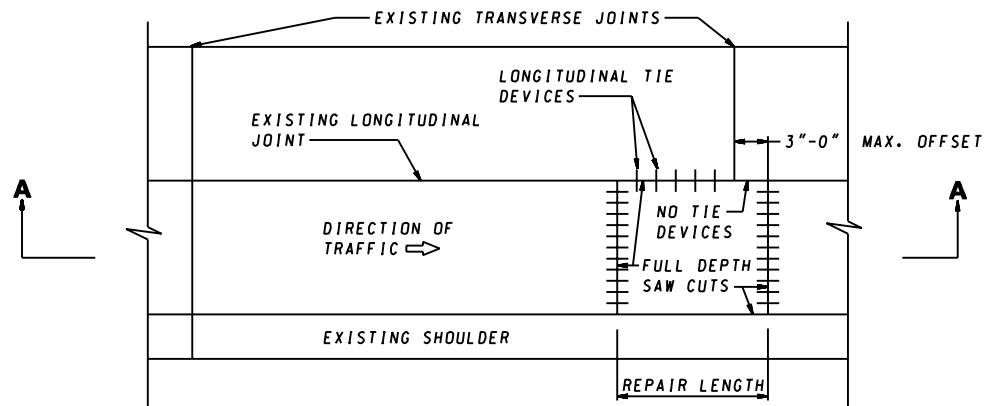
### NOTES

1. REPAIRS SHALL BE MADE IN ACCORDANCE WITH SECTION 522 OF THE SPECIFICATIONS.
2. REPAIRS SHALL BE MADE USING CONCRETE MEETING THE REQUIREMENTS OF SECTION 522.02 OF THE SPECIFICATIONS.
3. SUBGRADE PREPARATION SHALL BE IN ACCORDANCE WITH SUBSECTION 522.03.04 OF THE SPECIFICATIONS AND MAY REQUIRE ADDITIONAL MATERIAL TO FACILITATE PLACEMENT OF LOAD TRANSFER DEVICES.
4. HOLES FOR THE DOWELS AND LOAD TRANSFER TIE DEVICES SHALL BE DRILLED SIMULTANEOUSLY TO THE REQUIRED DEPTH USING FRAME MOUNTED DRILLS WHICH WILL MAINTAIN THE DRILLS IN A LONGITUDINALLY PARALLEL POSITION.
5. JOINTS SHALL BE MADE IN ACCORDANCE WITH SECTION 520 OF THE SPECIFICATIONS AND STANDARD MD 577.07.
6. ALL LOAD TRANSFER TIE BARS AND DOWELS SHALL BE EPOXY COATED.
7. SEE STANDARD MD 577.01 FOR PAVEMENT REPAIR SAW CUTS FOR LIFT OUT METHOD.

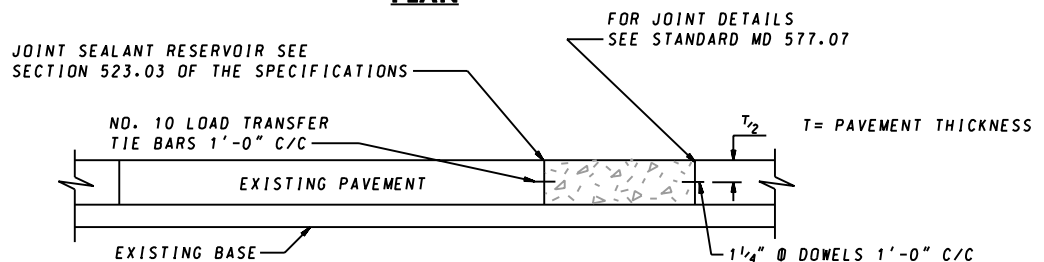
SPECIFICATION 522	CATEGORY CODE ITEMS	<div>Maryland Department of Transportation</div> <div>STATE HIGHWAY ADMINISTRATION</div> <div>STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES</div> <div>METHOD 'A' PLAIN</div> <div>PORTLAND CEMENT CONCRETE PAVEMENT</div> <div>TYPE 1 REPAIRS</div>			
APPROVED	<div>Kirk G. McCall</div> <div>DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT</div>				
<div>SHA</div> <div>State Highway Administration</div>	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION			
	APPROVAL 3-6-86	APPROVAL 3-18-86			
	REVISED 10-1-01	REVISED 4-26-89			
	REVISED	REVISED			
	REVISED	REVISED			
		STANDARD NO. MD 577.02			



**METHOD 'B'** REPAIRS PERFORMED AT AN EXISTING TRANSVERSE JOINT WHEN THE REPAIR EXCEEDS 3 FT. ON ONLY ONE SIDE OF THE JOINT. (NOTE THAT THE 3 FT. OFFSET IS TO ALLOW FOR THE REMOVAL AND REPLACEMENT OF DOWELS.)



### PLAN



### SECTION A-A

## REPAIR GUIDELINES

1. TYPE 1 REPAIRS ARE 6 FT TO LESS THAN 15 FT IN LENGTH AND DO NOT REQUIRE REINFORCEMENT. (PLAIN CONCRETE) TYPE 2 REPAIRS ARE 15 FT. AND GREATER IN LENGTH AND REQUIRE REINFORCEMENT. (REINFORCED CONCRETE) SEE METHOD 'D' ON STANDARD 577.05 FOR STEEL REINFORCEMENT DETAILS.
2. REPAIR SLABS AND REMAINS OF EXISTING SLABS SHALL NOT BE LESS THAN 6 FT. IN LENGTH.
3. EXISTING DOWELS AND ASSEMBLIES SHALL BE COMPLETELY REMOVED WHEN A REPAIR IS PERFORMED AT A TRANSVERSE JOINT.
4. ALL REPAIRS OFFSET MORE THAN 3 FT. ON EITHER SIDE OF AN EXISTING TRANSVERSE JOINT SHALL BE EXTENDED TO A MINIMUM OF 6 FT AND DOWEL ASSEMBLIES SHALL BE PLACED ADJACENT TO THE EXISTING TRANSVERSE JOINTS AS SHOWN IN REPAIR METHOD "C" ON STANDARD MD 577.04.

## NOTES

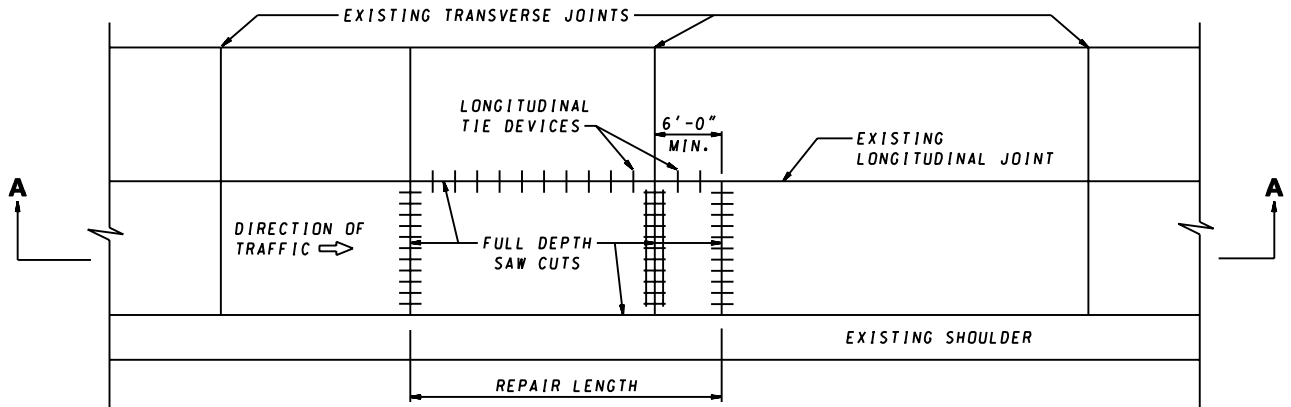
1. REPAIRS SHALL BE MADE IN ACCORDANCE WITH SECTION 522 OF THE SPECIFICATIONS.
2. REPAIRS SHALL BE MADE USING CONCRETE MEETING THE REQUIREMENTS OF SECTION 522.02 OF THE SPECIFICATIONS.
3. SUBGRADE PREPARATION SHALL BE IN ACCORDANCE WITH SUBSECTION 522.03.04 OF THE SPECIFICATIONS AND MAY REQUIRE ADDITIONAL MATERIAL TO FACILITATE PLACEMENT OF LOAD TRANSFER DEVICES.
4. HOLES FOR THE DOWELS AND LOAD TRANSFER TIE DEVICES SHALL BE DRILLED SIMULTANEOUSLY TO THE REQUIRED DEPTH USING FRAME MOUNTED DRILLS WHICH WILL MAINTAIN THE DRILLS IN A LONGITUDINALLY PARALLEL POSITION.
5. JOINTS SHALL BE MADE IN ACCORDANCE WITH SECTION 520 OF THE SPECIFICATIONS AND STANDARD MD 577.07.
6. ALL LOAD TRANSFER TIE BARS AND DOWELS SHALL BE EPOXY COATED.
7. SEE STANDARD MD 577.01 FOR PAVEMENT REPAIR SAW CUTS FOR LIFT OUT METHOD.

SPECIFICATION <b>522</b>	CATEGORY CODE ITEMS										
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT										
<b>SHA</b> State Highway Administration	<table> <tr> <td>APPROVAL • SHA REVISIONS</td><td>APPROVAL • FEDERAL HIGHWAY ADMINISTRATION</td></tr> <tr> <td>APPROVAL 3-6-86</td><td>APPROVAL 3-18-86</td></tr> <tr> <td>REVISED 10-1-01</td><td>REVISED 4-26-89</td></tr> <tr> <td>REVISED</td><td>REVISED</td></tr> <tr> <td>REVISED</td><td>REVISED</td></tr> </table>	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	APPROVAL 3-6-86	APPROVAL 3-18-86	REVISED 10-1-01	REVISED 4-26-89	REVISED	REVISED	REVISED	REVISED
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REVISED	REVISED										
REVISED	REVISED										

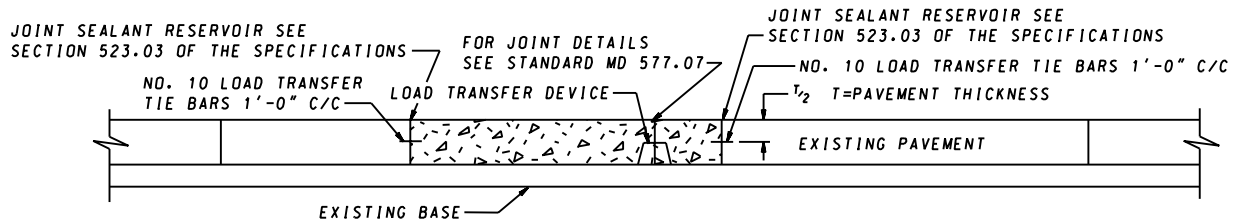
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**METHOD 'B' PLAIN OR CONVENTIONALLY**  
**REINFORCED PORTLAND CEMENT CONCRETE**  
**PAVEMENT TYPE 1 AND TYPE 2 REPAIRS**

**STANDARD NO. MD 577.03**

**METHOD 'C' REPAIRS EXCEEDING 3 FT. ON BOTH SIDES OF AN EXISTING TRANSVERSE JOINT.**



**PLAN**



**SECTION A-A**

**REPAIR GUIDELINES**

1. TYPE 1 REPAIRS ARE 6 FT. TO LESS THAN 15 FT. IN LENGTH AND REQUIRE NO REINFORCEMENT. (PLAIN CONCRETE)  
TYPE 2 REPAIRS ARE 15 FT. AND GREATER IN LENGTH AND REQUIRE REINFORCEMENT. (REINFORCED CONCRETE)  
SEE METHOD 'D' ON STANDARD 577.05 FOR STEEL REINFORCEMENT DETAILS.
2. REPAIR SLABS AND REMAINS OF EXISTING SLABS SHALL NOT BE LESS THAN 6 FT. IN LENGTH.
3. ALL REPAIRS OFFSET MORE THAN 3 FT ON EITHER SIDE OF AN EXISTING TRANSVERSE JOINT SHALL BE EXTENDED TO A MINIMUM OF 6 FT. AND DOWEL ASSEMBLIES SHALL BE PLACED ADJACENT TO THE EXISTING TRANSVERSE JOINT.
4. EXISTING DOWELS AND ASSEMBLIES SHALL BE COMPLETELY REMOVED WHEN A REPAIR IS PERFORMED AT A TRANSVERSE JOINT.

**NOTES**

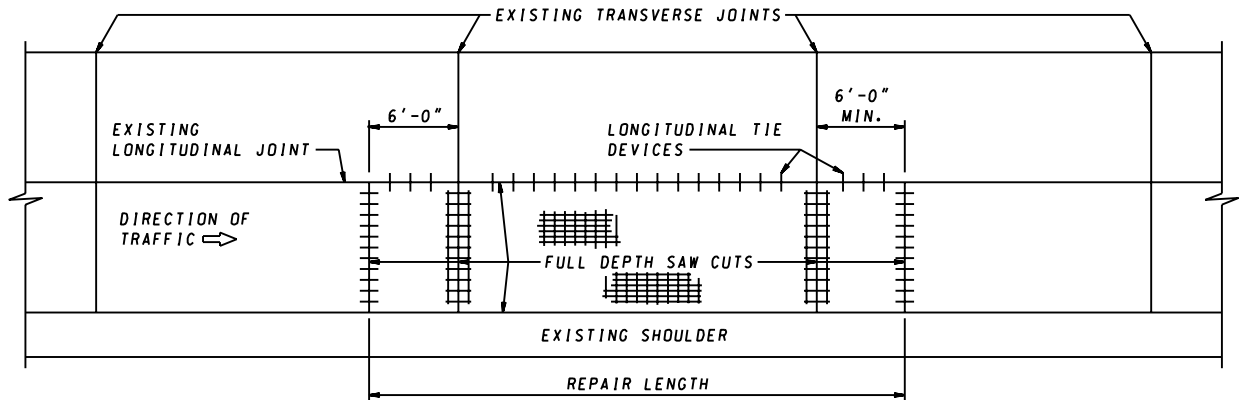
1. REPAIRS SHALL BE MADE IN ACCORDANCE WITH SECTION 522 OF THE SPECIFICATIONS.
2. REPAIRS SHALL BE MADE USING CONCRETE MEETING THE REQUIREMENTS OF SECTION 522.02 OF THE SPECIFICATIONS.
3. SUBGRADE PREPARATION SHALL BE IN ACCORDANCE WITH SUBSECTION 522.03.04 OF THE SPECIFICATIONS AND MAY REQUIRE ADDITIONAL MATERIAL TO FACILITATE PLACEMENT OF LOAD TRANSFER DEVICES.
4. HOLES FOR THE DOWELS AND LOAD TRANSFER TIE DEVICES SHALL BE DRILLED SIMULTANEOUSLY TO THE REQUIRED DEPTH USING FRAME MOUNTED DRILLS WHICH WILL MAINTAIN THE DRILLS IN A LONGITUDINALLY PARALLEL POSITION.
5. JOINTS SHALL BE MADE IN ACCORDANCE WITH SECTION 520 OF THE SPECIFICATIONS AND STANDARD MD 577.07.
6. ALL LOAD TRANSFER TIE BARS AND DOWELS SHALL BE EPOXY COATED.
7. SEE STANDARD MD 577.01 FOR PAVEMENT REPAIR SAW CUTS FOR LIFT OUT METHOD.

SPECIFICATION <b>522</b>	CATEGORY CODE ITEMS										
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT										
<b>SHA</b> State Highway Administration	<table> <tr> <td>APPROVAL • SHA REVISIONS</td><td>APPROVAL • FEDERAL HIGHWAY ADMINISTRATION</td></tr> <tr> <td>APPROVAL 3-6-86</td><td>APPROVAL 3-18-86</td></tr> <tr> <td>REVISED 10-1-01</td><td>REVISED 4-26-89</td></tr> <tr> <td>REVISED</td><td>REVISED</td></tr> <tr> <td>REVISED</td><td>REVISED</td></tr> </table>	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	APPROVAL 3-6-86	APPROVAL 3-18-86	REVISED 10-1-01	REVISED 4-26-89	REVISED	REVISED	REVISED	REVISED
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REVISED	REVISED										
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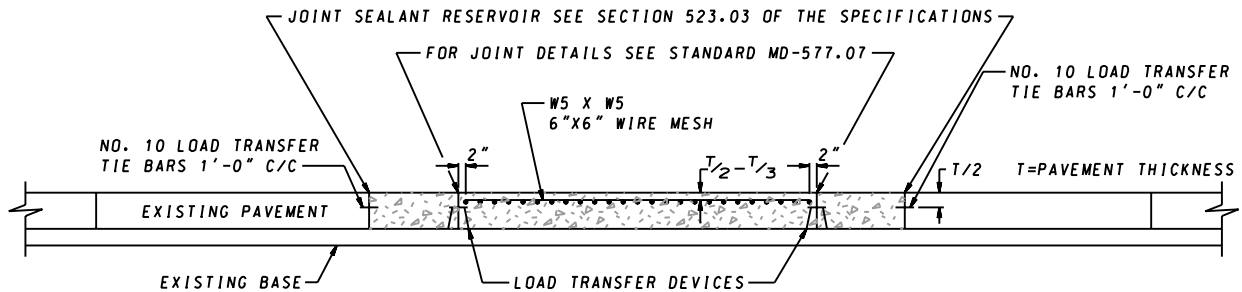
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**METHOD 'C' PLAIN OR CONVENTIONALLY**  
**REINFORCED PORTLAND CEMENT CONCRETE**  
**PAVEMENT TYPE 1 AND 2 REPAIRS**

**STANDARD NO. MD 577.04**

**METHOD 'D'** REPAIRS PERFORMED TO COMPLETELY REPLACE SLABS BETWEEN TWO TRANSVERSE JOINTS.



**PLAN**



**SECTION A-A**

**REPAIR GUIDELINES**

1. TYPE 1 REPAIRS ARE 6 FT. TO LESS THAN 15 FT. IN LENGTH AND REQUIRE NO REINFORCEMENT. (PLAIN CONCRETE)  
TYPE 2 REPAIRS ARE 15 FT. AND GREATER IN LENGTH AND REQUIRE REINFORCEMENT. (REINFORCED CONCRETE)
2. REPAIR SLABS AND REMAINS OF EXISTING SLABS SHALL NOT BE LESS THAN 6 FT. IN LENGTH.
3. EXISTING DOWELS AND ASSEMBLIES SHALL BE COMPLETELY REMOVED WHEN A REPAIR IS PERFORMED AT A TRANSVERSE JOINT.

**NOTES**

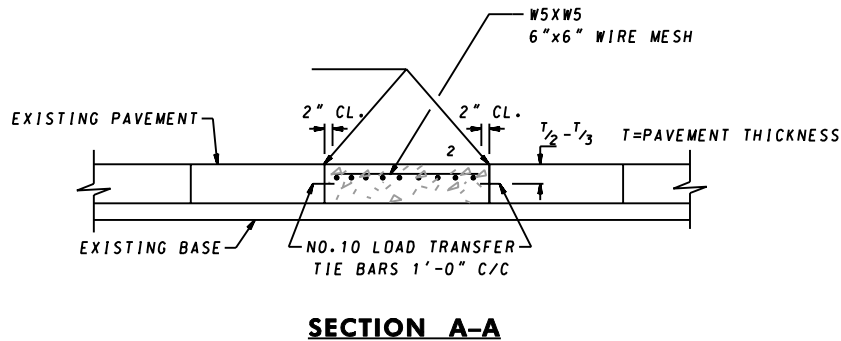
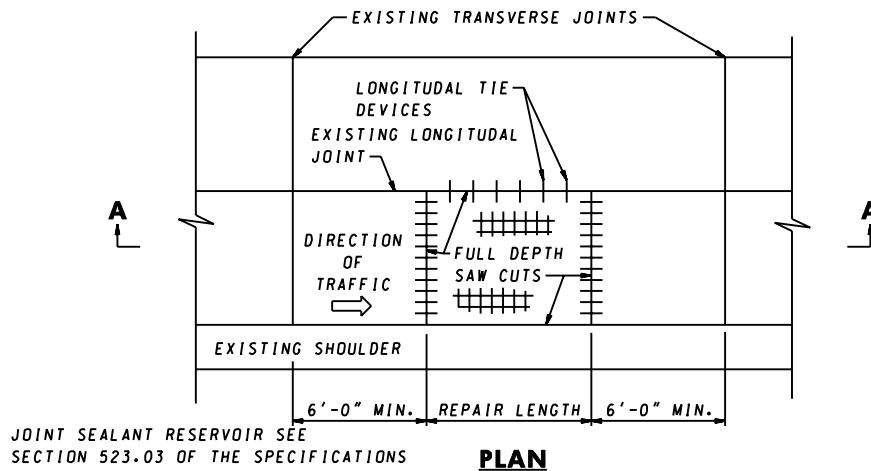
1. REPAIRS SHALL BE MADE IN ACCORDANCE WITH SECTION 522 OF THE SPECIFICATIONS.
2. REPAIRS SHALL BE MADE USING CONCRETE MEETING THE REQUIREMENTS OF SECTION 522.02 OF THE SPECIFICATIONS.
3. SUBGRADE PREPARATION SHALL BE IN ACCORDANCE WITH SUBSECTION 522.03.04 OF THE SPECIFICATIONS AND MAY REQUIRE ADDITIONAL MATERIAL TO FACILITATE PLACEMENT OF LOAD TRANSFER DEVICES.
4. HOLES FOR THE DOWELS AND LOAD TRANSFER TIE DEVICES SHALL BE DRILLED SIMULTANEOUSLY TO THE REQUIRED DEPTH USING FRAME MOUNTED DRILLS WHICH WILL MAINTAIN THE DRILLS IN A LONGITUDINALLY PARALLEL POSITION.
5. JOINTS SHALL BE MADE IN ACCORDANCE WITH SECTION 520 OF THE SPECIFICATIONS AND STANDARD MD 577.07.
6. ALL LOAD TRANSFER TIE BARS AND DOWELS SHALL BE EPOXY COATED.
7. SEE STANDARD MD 577.01 FOR PAVEMENT REPAIR SAW CUTS FOR LIFT OUT METHOD.

SPECIFICATION <b>522</b>	CATEGORY CODE ITEMS										
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT										
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REVISED	REVISED										
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**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**METHOD 'D' PLAIN OR CONVENTIONALLY**  
**REINFORCED PORTLAND CEMENT CONCRETE**  
**PAVEMENT TYPE 1 AND TYPE 2 REPAIRS**

**STANDARD NO. MD 577.05**

**METHOD 'E' REPAIRS PERFORMED AT MID SLAB OR A MINIMUM OF 6 FT. FROM AN EXISTING TRANSVERSE JOINT.**



**REPAIR GUIDELINES**

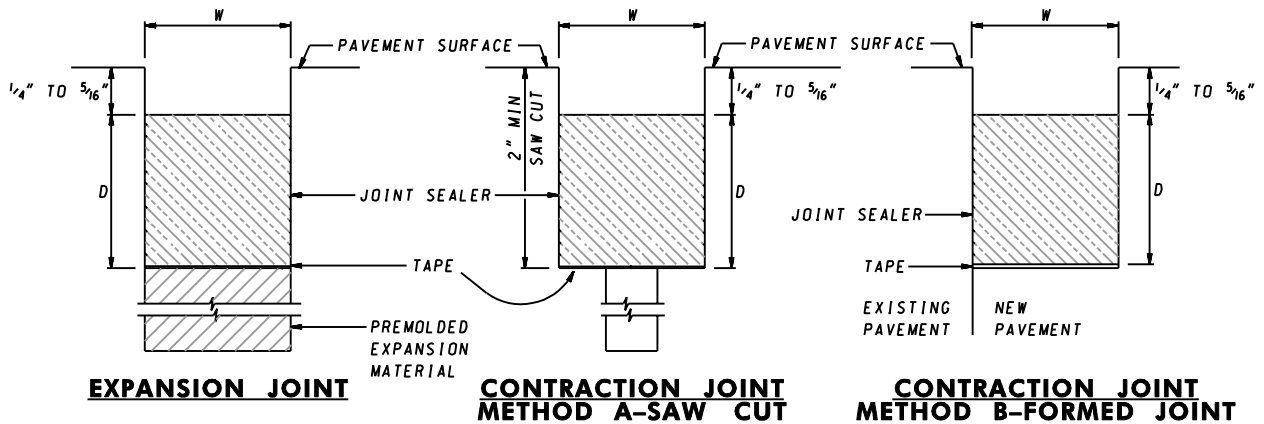
1. TYPE 1 REPAIRS ARE 6 FT TO LESS THAN 15 FT IN LENGTH AND REQUIRE REINFORCEMENT. (PLAIN CONCRETE)  
TYPE 2 REPAIRS ARE 15 FT AND GREATER IN LENGTH AND REQUIRE REINFORCEMENT. (REINFORCED CONCRETE)
2. REPAIR SLABS AND REMAINS OF EXISTING SLABS SHALL NOT BE LESS THAN 6 FT IN LENGTH.
3. EXISTING DOWELS AND ASSEMBLIES SHALL BE COMPLETELY REMOVED WHEN A REPAIR IS PERFORMED AT A TRANSVERSE JOINT.

**NOTES**

1. REPAIRS SHALL BE MADE IN ACCORDANCE WITH SECTION 522 OF THE SPECIFICATIONS.
2. REPAIRS SHALL BE MADE USING CONCRETE MEETING THE REQUIREMENTS OF SECTION 522.02 OF THE SPECIFICATIONS.
3. SUBGRADE PREPARATION SHALL BE IN ACCORDANCE WITH SUBSECTION 522.03.04 OF THE SPECIFICATIONS AND MAY REQUIRE ADDITIONAL MATERIAL TO FACILITATE PLACEMENT OF LOAD TRANSFER DEVICES.
4. HOLES FOR THE DOWELS AND LOAD TRANSFER TIE DEVICES SHALL BE DRILLED SIMULTANEOUSLY TO THE REQUIRED DEPTH USING FRAME MOUNTED DRILLS WHICH WILL MAINTAIN THE DRILLS IN A LONGITUDINALLY PARALLEL POSITION.
5. JOINTS SHALL BE MADE IN ACCORDANCE WITH SECTION 520 OF THE SPECIFICATIONS AND STANDARD MD-577.07.
6. ALL LOAD TRANSFER TIE BARS AND DOWELS SHALL BE EPOXY COATED.
7. SEE STANDARD MD-577.01 FOR PAVEMENT REPAIR SAW CUTS FOR LIFT OUT METHOD.

SPECIFICATION <b>522</b>	CATEGORY CODE ITEMS										
APPROVED <i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT											
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REVISED	REVISED										
REVISED	REVISED										

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**METHOD 'E' PLAIN OR CONVENTIONALLY**  
**REINFORCED PORTLAND CEMENT**  
**CONCRETE PAVEMENT TYPE 1 AND 2 REPAIRS**  
**STANDARD NO. MD 577.06**

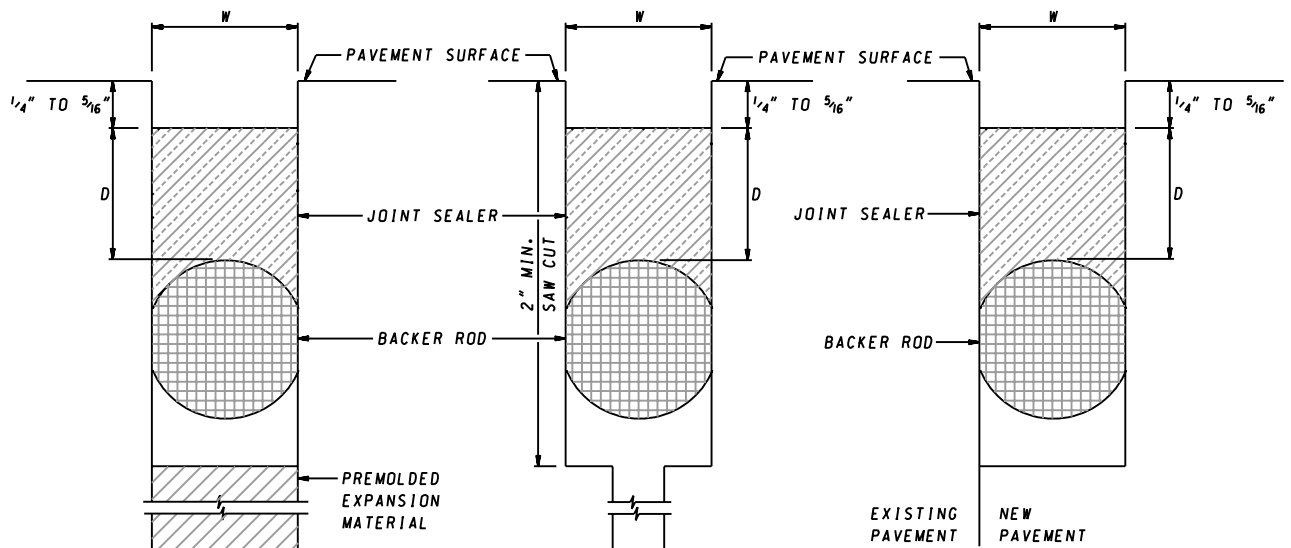


**EXPANSION JOINT**

**CONTRACTION JOINT METHOD A-SAW CUT**

**CONTRACTION JOINT METHOD B-FORMED JOINT**

**JOINTS WITH TAPE**



**EXPANSION JOINT**

**CONTRACTION JOINT METHOD A-SAW CUT**

**CONTRACTION JOINT METHOD B-FORMED JOINT**

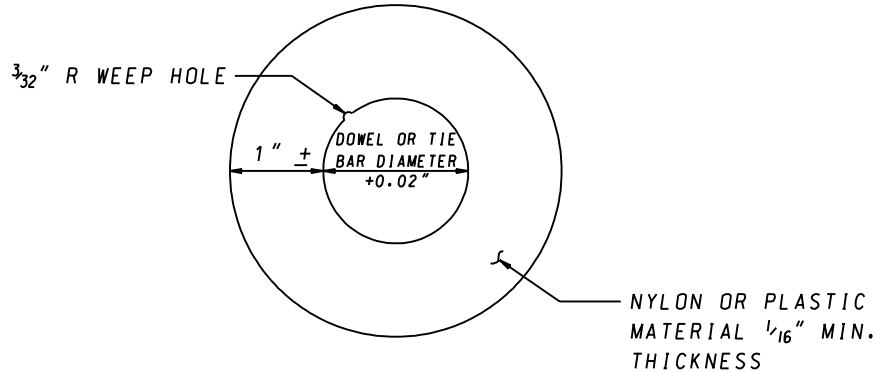
**JOINTS WITH BACKER ROD**

SLAB THICKNESS = "T"  
BACKER ROD DIA. = 1.25W

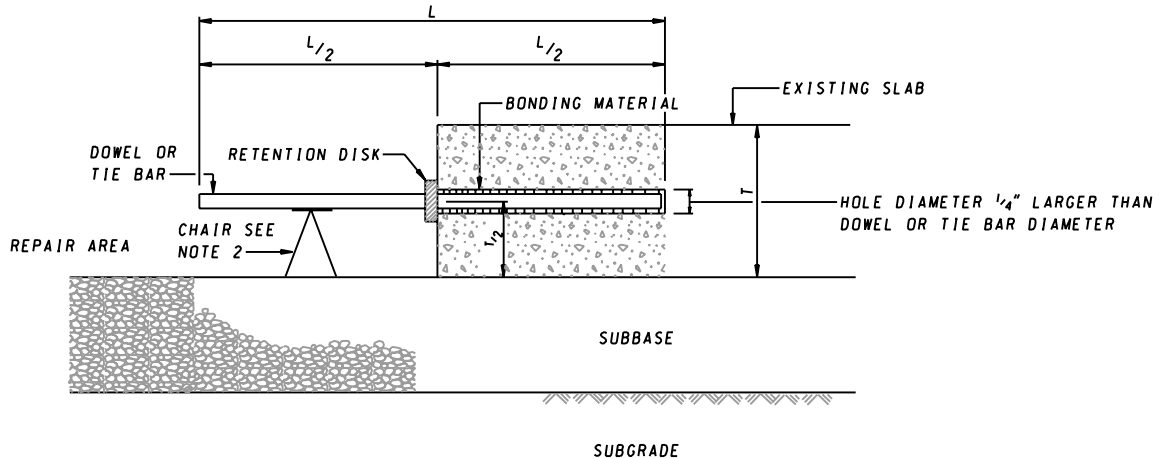
**NOTES**

1.  $W = \frac{3}{4}$ " FOR TRANSVERSE EXPANSION JOINTS UNLESS FIELD CONDITIONS REQUIRE A LARGER OPENING.  
 $D = W$  UNLESS SILICONE JOINT SEALANT IS USED, THEN  $D = \frac{1}{2} W$ .  
 $W = \frac{1}{4}$ " TO  $\frac{3}{8}$ " FOR TRANSVERSE CONTRACTION JOINTS & LONGITUDINAL JOINTS.
2. THE CONTRACTOR MAY ELECT TO USE TAPE OR BACKER ROD TO MAINTAIN THE SPECIFIED SHAPE FACTORS FOR THE JOINT SEALANT. THE ENGINEER MAY REQUIRE THE USE OF THE BACKER ROD IF THE TAPE METHOD DOES NOT PROHIBIT BOND OF THE JOINT SEALANT TO THE BOTTOM OF THE RESERVOIR OR IF THE BOTTOM OF THE RESERVOIR IS TOO LOW TO MAINTAIN THE SHAPE FACTOR AND THE  $\frac{1}{4}$ " TO  $\frac{5}{16}$ " CLEARANCE BETWEEN THE TOP SURFACE OF THE JOINT SEALANT AND THE ROADWAY SURFACE.
3. SEE SECTION 520 OF THE SPECIFICATIONS.
4. THE INITIAL SAW CUT SHALL BE  $T/4 + \frac{1}{4}$ " AND SHALL BE COMPLETED WITHIN 24 HOURS AFTER PLACEMENT OF CONCRETE.
5. COST OF JOINTS SHALL BE INCIDENTAL TO THE PRICE BID FOR CONCRETE PAVEMENT REPAIRS OR CONCRETE PAVEMENTS.

SPECIFICATION <b>520</b>	CATEGORY CODE ITEMS	<b>Maryland Department of Transportation</b> <b>STATE HIGHWAY ADMINISTRATION</b> STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES <b>JOINTS FOR PLAIN OR CONVENTIONALLY</b> <b>REINFORCED PORTLAND CEMENT</b> <b>CONCRETE PAVEMENTS</b>	
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT		
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	APPROVAL <b>3-6-86</b>	APPROVAL <b>3-18-86</b>	
	REVISED <b>10-1-01</b>	REVISED <b>2-24-88</b>	
	REVISED	REVISED	
<b>STANDARD NO. MD 577.07</b>			



**RETENTION DISK**



**TYPICAL ELEVATION VIEW**

**NOTES**

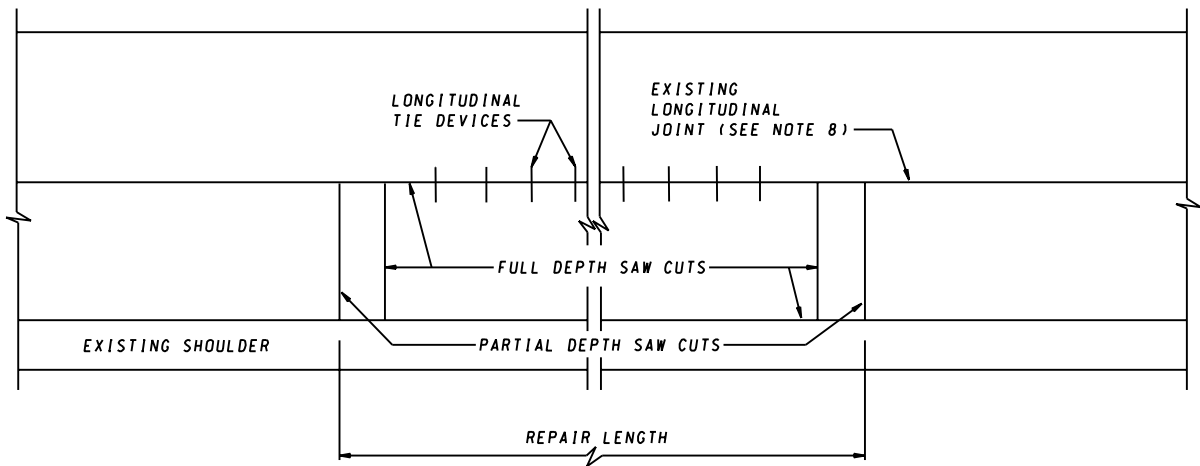
1. TO PREVENT LOSS OF BONDING MATERIAL THE RETENTION DISK SHALL BE HELD IN PLACE WITH WOOD STAKES, REBARS, TAPE OR OTHER MEANS APPROVED BY THE ENGINEER.
2. A CHAIR OR OTHER ACCEPTABLE DEVICE SHALL BE USED TO MAINTAIN THE DOWEL OR TIE BAR IN A LEVEL HORIZONTAL POSITION. LEVELING DEVICES SHALL BE REMOVED AFTER THE BONDING MATERIAL HAS SET.
3. COST OF THE DOWEL OR TIE BAR, DRILLED HOLES, RETENTION DISK, LEVELING DEVICES, BONDING MATERIAL, ALL EQUIPMENT, TOOLS, AND LABOR SHALL BE INCIDENTAL TO THE RESPECTIVE TYPE 1 OR 2 REPAIR PAY ITEM IN THE INVITATION FOR BIDS.
4. BONDING MATERIAL PER 902.11.

SPECIFICATION <b>522</b>	CATEGORY CODE ITEMS										
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT										
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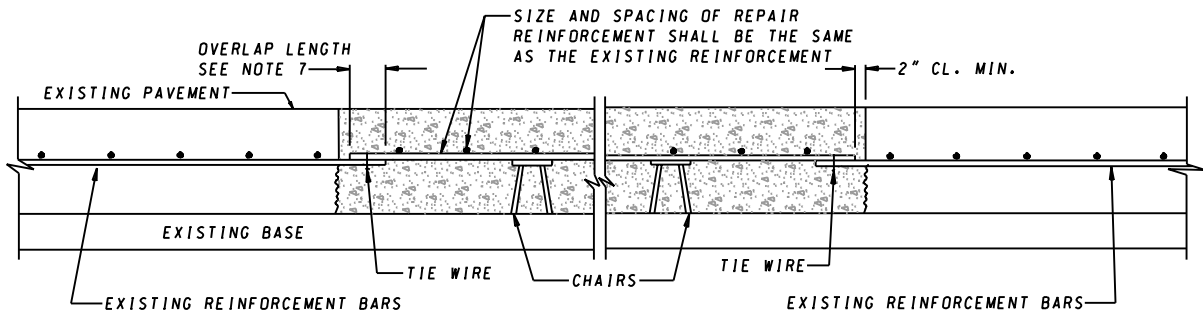
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**DOWEL AND TIE BAR ANCHORAGE FOR  
 TYPE 1 AND TYPE 2 PAVEMENT REPAIRS**

**STANDARD NO. MD 577.08**



**PLAN**



**ELEVATION**

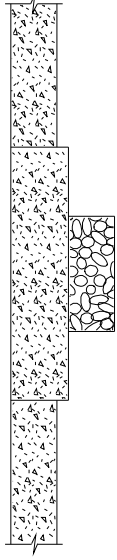
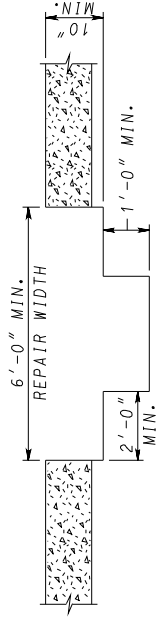
**NOTES**

1. REPAIRS SHALL BE MADE IN ACCORDANCE WITH SECTION 522 OF THE SPECIFICATIONS.
2. REPAIRS SHALL BE MADE USING CONCRETE MEETING THE REQUIREMENTS OF SECTION 522.02 OF THE SPECIFICATIONS.
3. SUBGRADE PREPARATION SHALL BE MADE IN ACCORDANCE WITH SUBSECTION 522.03.04 OF THE SPECIFICATIONS.
4. LONGITUDINAL JOINT SHALL BE MADE IN ACCORDANCE WITH SECTION 520 OF THE SPECIFICATIONS AND STD. MD 577.07.
5. ALL REINFORCEMENT BARS, CHAIRS, TIE DEVICES AND TIE WIRES SHALL BE EPOXY COATED.
6. PAVEMENT REPAIR SAW CUTS AND LIFT OUT METHOD SEE STD. MD 577.01.
7. REINFORCEMENT STEEL OVERLAP SHALL BE 18" MINIMUM FOR NO.5 STEEL BARS AND 22" MINIMUM FOR NO. 6 STEEL BARS.
8. IN INSTANCES WHERE THE EXISTING PAVEMENT WAS POURED AS ONE SLAB THE LONGITUDINAL TIE DEVICES ARE NOT APPLICABLE. THE SAW CUTS SHALL EXTEND THE FULL WIDTH OF THE PAVEMENT.

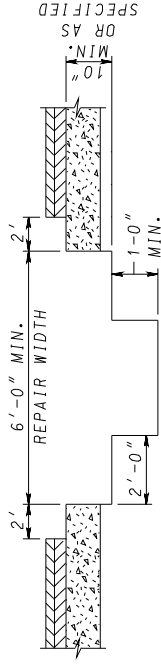
SPECIFICATION <b>522</b>	CATEGORY CODE ITEMS										
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REVISED	REVISED										

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**CONTINUOUSLY REINFORCED**  
**PORTLAND CEMENT CONCRETE PAVEMENT**  
**REPAIRS**

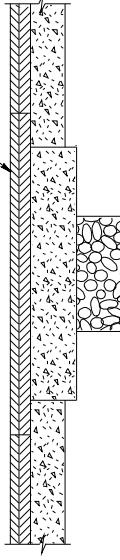
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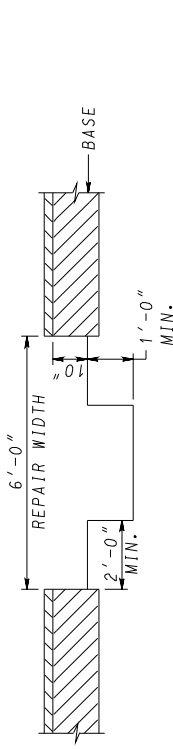
## RIGID PAVEMENT



DEPTH OF HOT MIX ASPHALT  
SAME AS EXISTING.



## HOT MIX ASPHALT PAVEMENT WITH PORTLAND CEMENT CONCRETE BASE



HOT MIX ASPHALT



PORTLAND CEMENT CONCRETE




NO. 57 AGGREGATE

2" MIN. HOT MIX ASPHALT SURFACE

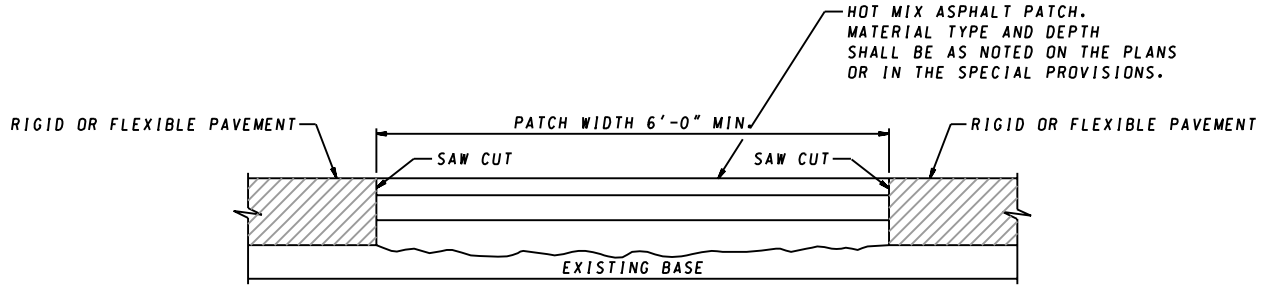
## FLEXIBLE PAVEMENT

### NOTES

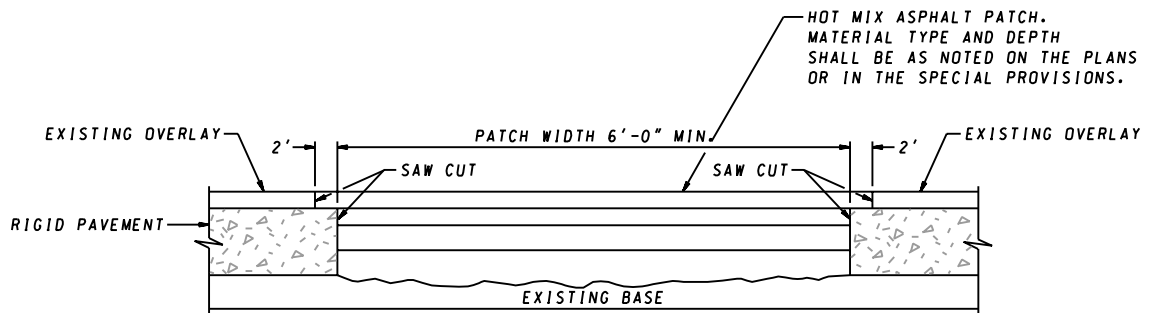
1. THIS STANDARD IS TO BE USED IN ACCORDANCE WITH SECTIONS 505 AND 522. THE ROADWAY SHALL BE PATCHED WITH THE SAME TYPE MATERIAL REMOVED UNLESS NOTED IN THE SPECIFICATIONS. PORTLAND CEMENT CONCRETE PAVEMENT REPAIR SHALL BE IN ACCORDANCE WITH STANDARDS 577.02, 577.03, 577.04, 577.05, 577.06, OR 577.10.
2. THE TOP 1 FT. OF THE TRENCH SHALL BE FILLED WITH NO. 57 AGGREGATE. TRENCH TO BE EXTENDED TO DITCH LINE.
3. WHEREVER A TRENCH CROSSES A CONCRETE ROADWAY THAT HAS JOINT INSTALLATIONS THE ENTIRE SLAB BETWEEN THE EDGE OF THE TRENCH AND NEAREST JOINT SHALL BE REMOVED IF THE DISTANCE IS LESS THAN 6 FT.
4. CLEAN AND WET EDGES OF CUT AND SUBBASE BEFORE PLACING CONCRETE.
5. ALL WORK SUCH AS TRENCH BACKFILL, CURING OF CONCRETE, MATERIALS USED, ETC. SHALL BE IN ACCORDANCE WITH SECTIONS 201, 505 AND 522 OF THE SPECIFICATIONS OR AS SPECIFIED IN THE PERMIT.
6. ALL COSTS FOR SAWCUTS, TRENCH EXCAVATION, BACKFILL, HOT MIX ASPHALT, CONCRETE, NO. 57 AGGREGATE, MATERIALS, TOOLS, LABOR AND INCIDENTALS SHALL BE INCLUDED IN THE PRICE OF THE UTILITY ITEMS.
7. RIGID PAVEMENT REPAIRS AS SHOWN SHALL BE MADE USING CONCRETE MIX NO. 9 (NINE) MEETING THE REQUIREMENTS OF SECTION 902 OF THE SPECIFICATIONS UNLESS OTHERWISE SPECIFIED IN THE SPECIAL PROVISIONS, ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

Maryland Department of Transportation STATE HIGHWAY ADMINISTRATION STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES REPAIRING PAVEMENT OPENINGS FOR UTILITY TRENCHES	
SPECIFICATION 505	CATEGORY CODE ITEMS
APPROVED	<div><div><div>State Highway Administration</div></div><div><div>DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT</div><div><i>Kat G. McCall</i></div></div><div><div>APPROVAL • SHA REVISIONS</div><div>APPROVAL 3-6-86 REVISED 9-30-04 REVISED 3-25-10 REVISED</div><div>APPROVAL • FEDERAL HIGHWAY ADMINISTRATION</div><div>APPROVAL 3-18-86 REVISED</div></div></div>
STANDARD NO. MD 578.01	





### **RIGID OR FLEXIBLE PAVEMENT**



### **RIGID PAVEMENT WITH FLEXIBLE OVERLAY**

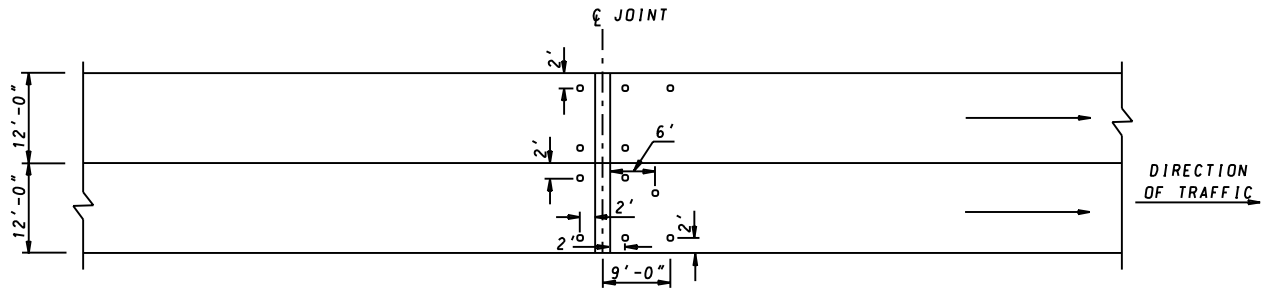
#### **NOTES**

1. REFER TO SECTION 505 OF THE SPECIFICATIONS FOR FLEXIBLE PAVEMENT AND TO SECTION 522 OF THE SPECIFICATIONS FOR RIGID PAVEMENT.
2. TACK COAT TO BE APPLIED TO THE PATCH. APPLY EVENLY WITH PRESSURIZED SPRAY WAND.
3. REFER TO APPLICABLE PLAIN AND REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT TYPE 1 AND TYPE 2 REPAIR STANDARDS FOR PERMANENT RIGID REPAIRS.

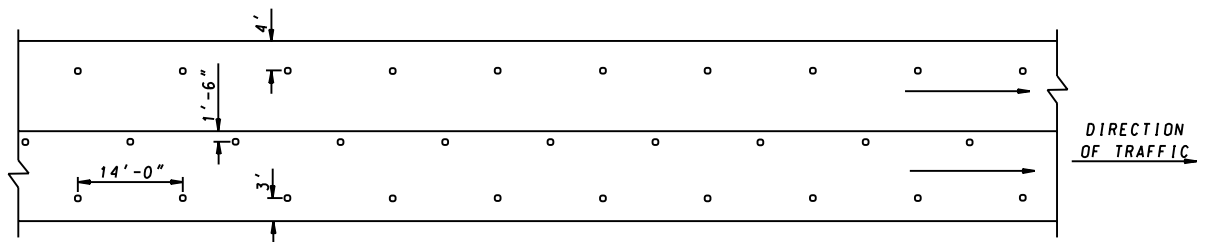
SPECIFICATION <b>505</b>	CATEGORY CODE ITEMS										
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT										
<b>SHA</b> State Highway Administration	<table> <tr> <td>APPROVAL • SHA REVISIONS</td><td>APPROVAL • FEDERAL HIGHWAY ADMINISTRATION</td></tr> <tr> <td>APPROVAL <b>3-6-86</b></td><td>APPROVAL <b>3-18-86</b></td></tr> <tr> <td>REVISED <b>10-1-01</b></td><td>REVISED</td></tr> <tr> <td>REVISED</td><td>REVISED</td></tr> <tr> <td>REVISED</td><td>REVISED</td></tr> </table>	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	APPROVAL <b>3-6-86</b>	APPROVAL <b>3-18-86</b>	REVISED <b>10-1-01</b>	REVISED	REVISED	REVISED	REVISED	REVISED
APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION										
APPROVAL <b>3-6-86</b>	APPROVAL <b>3-18-86</b>										
REVISED <b>10-1-01</b>	REVISED										
REVISED	REVISED										
REVISED	REVISED										

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**PERMANENT PATCHING FOR RIGID  
 OR FLEXIBLE PAVEMENT USING  
 HOT MIX ASPHALT**

**STANDARD NO. MD 578.03**



**CONVENTIONALLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT**  
 "TRAVEL" LANE FOR MULTIPLE LANES OR BOTH LANES OF 2 LANE DIRECTIONAL ROADWAY



**CONTINUOUSLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT**

### NOTES

1. ACTUAL LOCATION OF HOLES WILL BE DETERMINED BY THE ENGINEER.
2. SUBSEALING SHALL CONFORM TO THE CONTRACT DOCUMENTS.
3. LOCATION OF HOLES ARE SUBJECT TO CHANGE ACCORDING TO EXISTING FIELD CONDITIONS.

SPECIFICATION <b>520</b>	CATEGORY CODE ITEMS										
APPROVED <i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT											
<b>SHA</b> State Highway Administration	<table> <tr> <td>APPROVAL • SHA REVISIONS</td><td>APPROVAL • FEDERAL HIGHWAY ADMINISTRATION</td></tr> <tr> <td>APPROVAL 1-5-88</td><td>APPROVAL 2-2-88</td></tr> <tr> <td>REVISED 10-1-01</td><td>REVISED</td></tr> <tr> <td>REVISED</td><td>REVISED</td></tr> <tr> <td>REVISED</td><td>REVISED</td></tr> </table>	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	APPROVAL 1-5-88	APPROVAL 2-2-88	REVISED 10-1-01	REVISED	REVISED	REVISED	REVISED	REVISED
APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION										
APPROVAL 1-5-88	APPROVAL 2-2-88										
REVISED 10-1-01	REVISED										
REVISED	REVISED										
REVISED	REVISED										

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**TYPICAL HOLE PATTERNS FOR PORTLAND  
 CEMENT CONCRETE PAVEMENT SUBSEALING**

**STANDARD NO. MD 579.01**